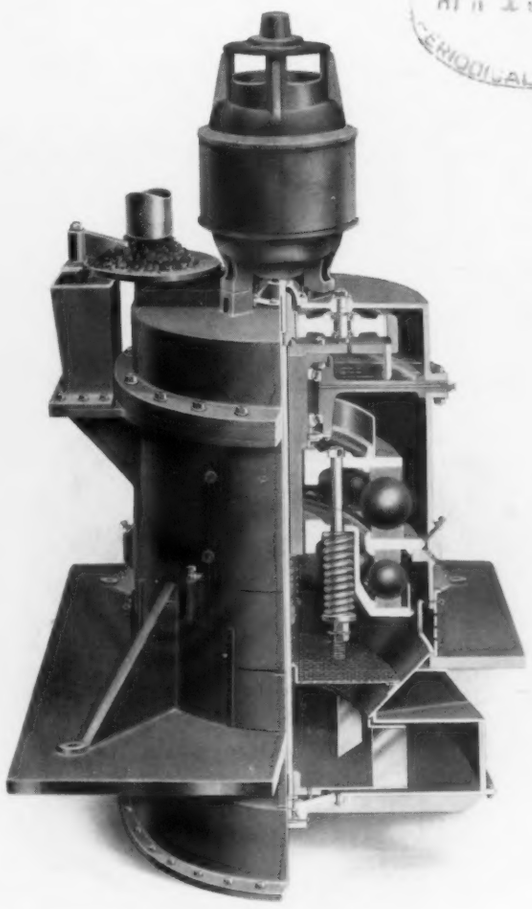
Pit and Quarry
With which is consolidated
CEMENT-MILL & QUARRY
DECEMBER, 1935

APR 15 193
PERIODICAL DIV



NEW!

Traylor-Collins Pulverizer Mill

A new product of an organization that has pioneered many money-saving machines in the rock products field over a period of thirty years and more.

The Traylor-Collins Pulverizer Mill will be found efficient and economical for the grinding of coal for many purposes, particularly for direct firing of kilns; for the lime industry; in the manufacture of ceramics, brick and clay products; in the fertilizer field; for the grinding of rock for many uses; and many other applications.

Operators interested in cost-cutting processes should closely investigate this new machine. Write to our office nearest you for our bulletin No. 1002.

TRAYLOR ENGINEERING & MANUFACTURING CO.
ALLENTOWN, PENNSYLVANIA, U.S.A.

NEW YORK CITY 2513 Empire State Bldg. | CHICAGO 2151 One La Salle St. Bldg. | SALT LAKE CITY 101 West Second South St. | LOS ANGELES 919 Chester William Bldg. | SEATTLE 6311 22nd Ave., N. E.

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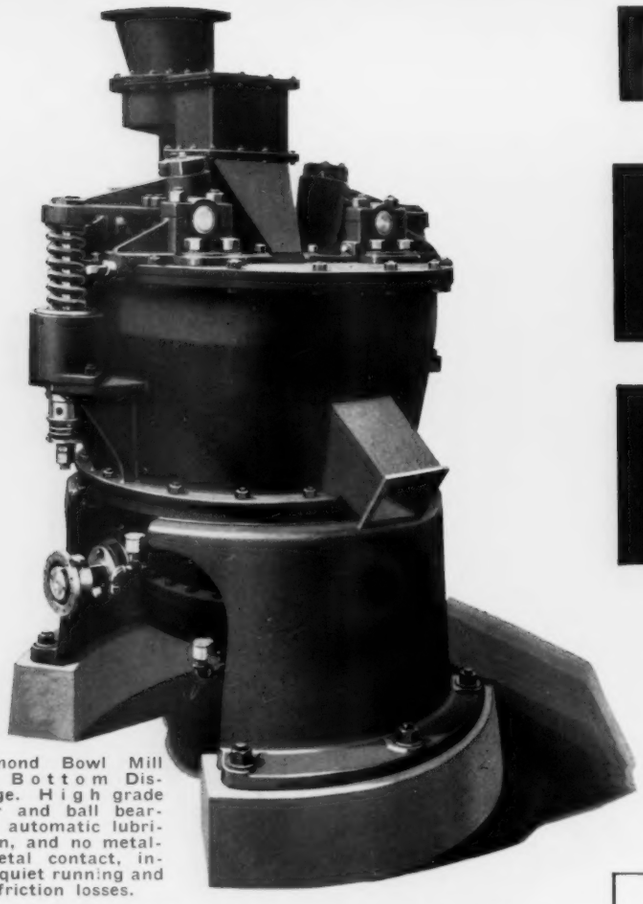
Pages 15-23

Since 1929 the largest net paid A. B. C. producer circulation in the field

Raymond BOWL MILL

for fine or coarse grinding



Raymond Bowl Mill with Bottom Discharge. High grade roller and ball bearings, automatic lubrication, and no metal-to-metal contact, insure quiet running and low friction losses.

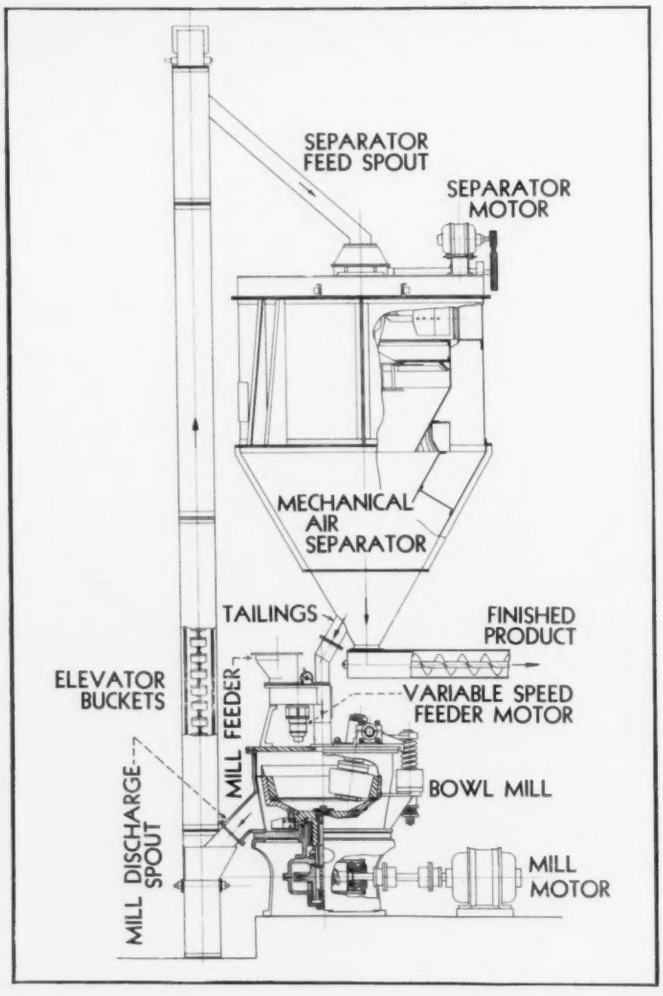
IF the Bowl Mill applies to your problem. you can use it and gain the advantages that go with this modern method of pulverizing. Brought to completion in 1935—climaxing 48 years' experience—it is so far advanced in mechanical efficiency, as to give you a distinct "edge" over competitive plants.

Originally applied to coal, the Bowl Mill is equally suited for other non-metallic minerals and certain manufactured products, as in custom grinding. Limestone, gypsum, bauxite, are a few of the materials within its broad range of use.

For pulverizing up to 325-mesh fineness. you can operate the Bowl Mill in closed circuit with a Raymond Mechanical Air Separator, obtaining a uniform product at a record low cost per ton. For coarse stuff, down to 10-mesh, you can arrange the mill to discharge on screens, getting extra large capacities.

The economies of the Bowl Mill would justify re-equipping your plant now, in anticipation of heavy demands for rock products of all kinds in 1936. In power savings and improved production, this machine actually liquidates its cost in a matter of months.

We invite your inquiries, and suggest that you submit samples for running a Bowl Mill test on your materials.



RAYMOND BROS. IMPACT PULVERIZER CO.
Division of Combustion Engineering Company, Inc.
1321 North Branch Street Chicago
Sales Offices in all Principal Cities
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During the winter- Plan for the Spring

SOME "MODERNIZATION FOR PROFIT" SUGGESTIONS

PLAN for lower operating costs and a better product when your plant opens up next spring, by making replacements and additions to your equipment now.

To take fullest advantage of the greater opportunities which should come from Government and other work, you must be able to meet rigid specifications.

A few suggestions for profitable modernization are illustrated. There are others. Send for Book No. 1240.

5486

LINK-BELT COMPANY

The Leading Manufacturer
of Equipment for Handling Materials and Transmitting Power

CHICAGO PHILADELPHIA INDIANAPOLIS
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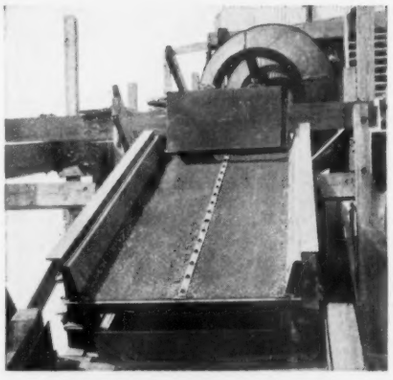
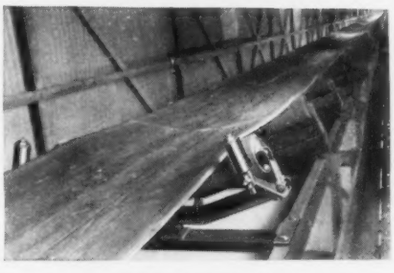


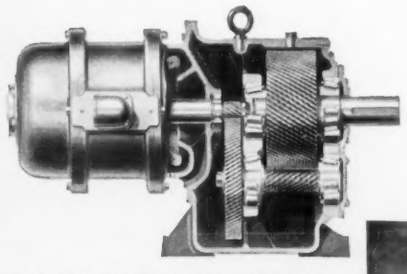
SCREENING

Supplement your rotary screens with Link-Belt vibrating screens to obtain a better grading of the smaller sizes of gravel or stone. Rotary screens for better washing — vibrating screens for better sizing. The combination of both rotary and vibrating screens assures your ability to meet the most rigid specifications.



BELT CONVEYORS

Replace your old, plain-bearing belt conveyor idlers with modern Link-Belt anti-friction bearing idlers. Save power, assure dependability and cut down maintenance costs.



REPLACE OPEN GEAR DRIVES

Greater efficiency as well as safety can be obtained by using Link-Belt speed reducers. The Link-Belt line includes herringbone gear, worm gear and motorized helical gear reducers as well as variable speed transmissions, silent chain and roller chain drives.

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The Rotoscoop is a perfected and dewatering unit which is capable of recovering fine grains and discharging dry enough for truck transportation. Send for Folder No. 1463.

LINK-BELT

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APR -1 1936

Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

Volume 28 DECEMBER, 1935 Number 6

MEMBER AUDIT BUREAU OF CIRCULATIONS

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other non-metallic minerals. Entered as second-class matter November 28, 1932, at the Postoffice at Chicago, Ill., under the Act of March 3, 1897.

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TOUGH LOADS? YES!

— But those are Tough Tires, too!

Tough loads? Of course! That's what dump trucks are built for. And so are Goodyear Dump Truck Tires. That's why you see so many dump trucks, everywhere, rolling on Goodyears.

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money savers

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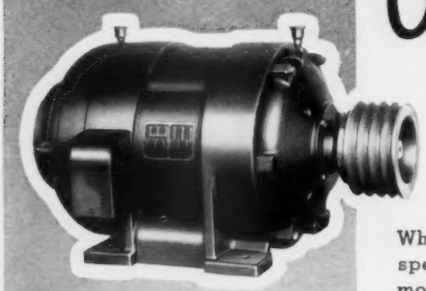
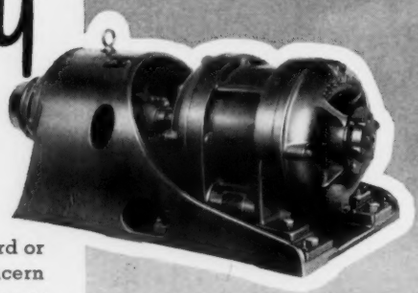
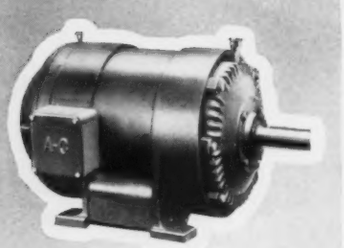
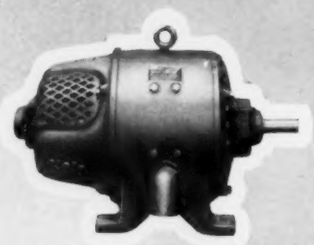
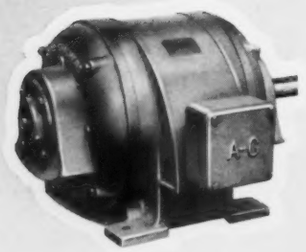


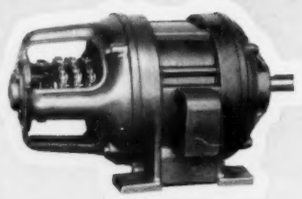


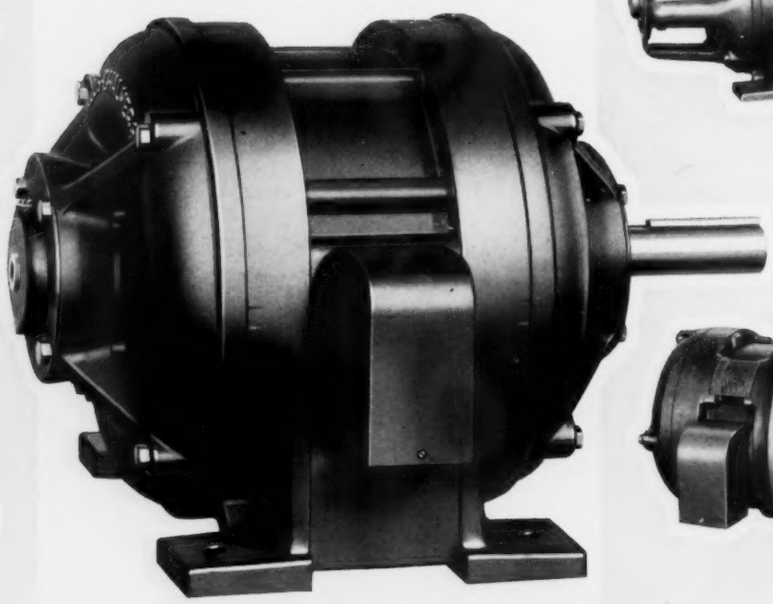
Whether your motor requirements are standard or special, or whether the desired features concern mountings or electrical characteristics makes no difference . . . we supply your motor needs and do so with performance plus. • A small plant in Norwood, Ohio, which became a part of the Allis-Chalmers Mfg. Co. forty years ago, pioneered in the building of standard and special motors. • Allis-Chalmers manufactures the most diversified line of machinery of any company on the American continent. • All the motor knowledge gleaned from pioneering days to the present time and all the experience acquired in producing motors for its own vast line of rugged power driven machinery are the inheritance of Allis-Chalmers Motors today . . . that knowledge, that experience and the guiding principle of quality as an ideal are built into every Allis-Chalmers Motor. They are the sturdiest motors on the market—bar none. Allis-Chalmers manufactures motors of every type, both standard and special, and their district offices, in all principal cities, are ready to assist you in all problems of motor application.

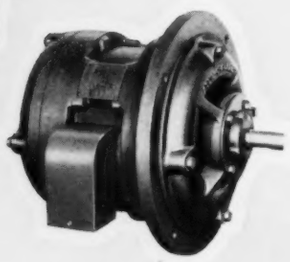








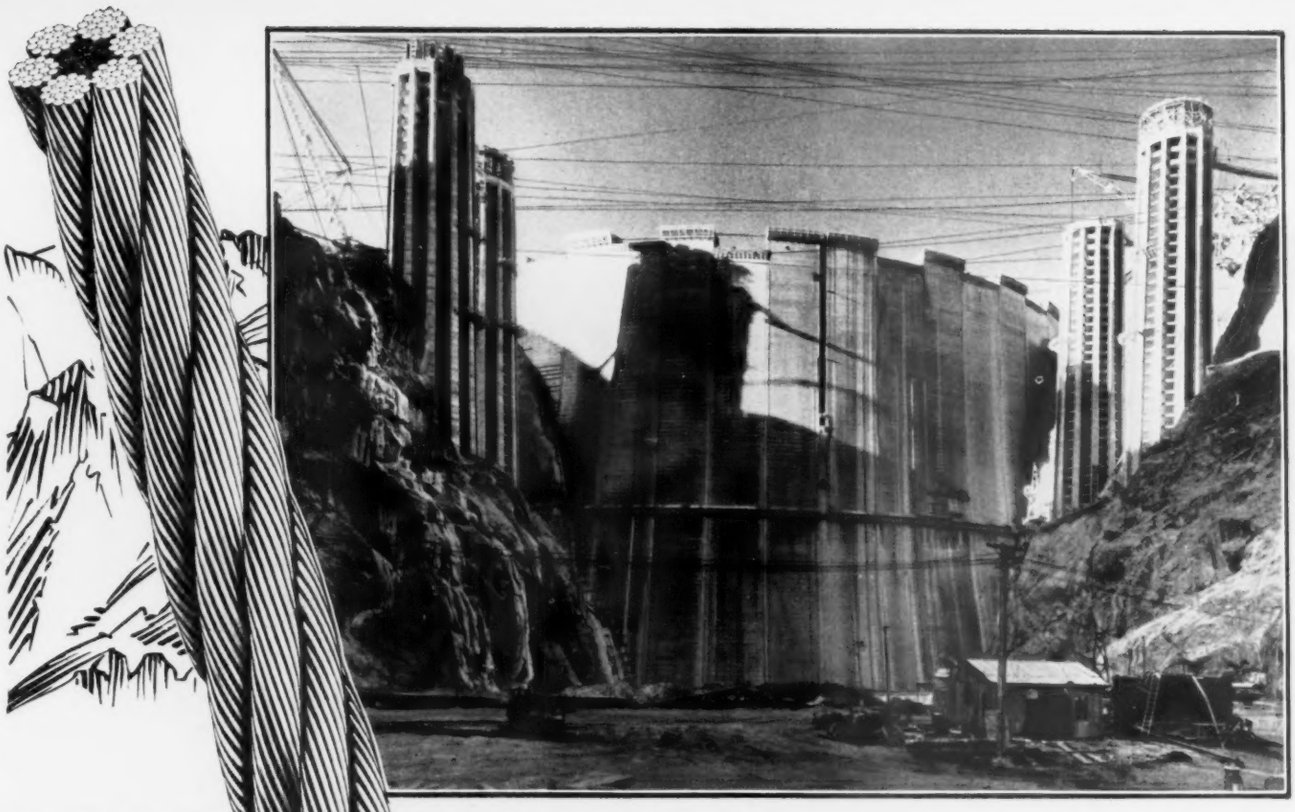




MOTORS

FOR EVERY PURPOSE

ALLIS-CHALMERS MFG. CO. MILWAUKEE, WISCONSIN



TIGER BRAND WIRE ROPE *Helped Build* BOULDER DAM

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REG. U. S. PAT. OFF.
WIRE ROPE

Tiger Brand Wire Rope is available in Standard (non-preformed) or Excellay (pre-formed) constructions.

Use Tiger Wire Rope Clips—identified by their yellow base.

OVER 160 miles of **Tiger Brand Wire Rope and Cable** were used in the construction of Boulder Dam—on cable-ways, excavators, elevators, bridges, slings, etc. Many of the Ropes were special constructions. In every field of application—the chances are you will find **American Steel & Wire Company Tiger Brand Wire Rope** doing the work—doing it better and more economically. This widespread preference is based on proved service records—and on the knowledge that no problem is so large or so small that our engineers will not welcome an opportunity to cooperate.

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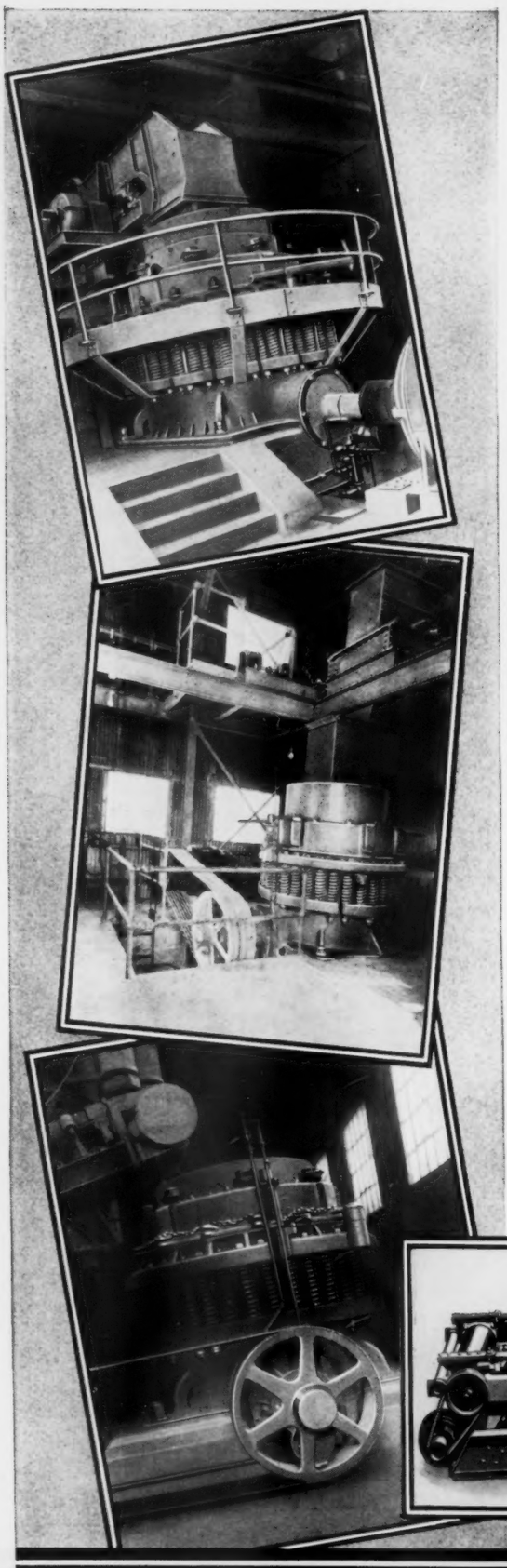

Prepare NOW for next year's operations

If confronted with the problem of producing better materials at lower cost, Symons Crushers and Screens have a definite part in a modernization program or where increased capacity is required. This has been proved by their performance among most of the major producers of crushed materials.

For more than eight years, Symons Standard Cone Crushers have led in the field of reduction crushing. With the trend toward finer crushing, the newer Short Head fills the need for these finer products. With their big capacity and lower crushing cost, they are a most essential factor for profitable operation.

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If you are contemplating any changes in your crushing or screening operations, let us tell you more about the advantages of these Nordberg Products.

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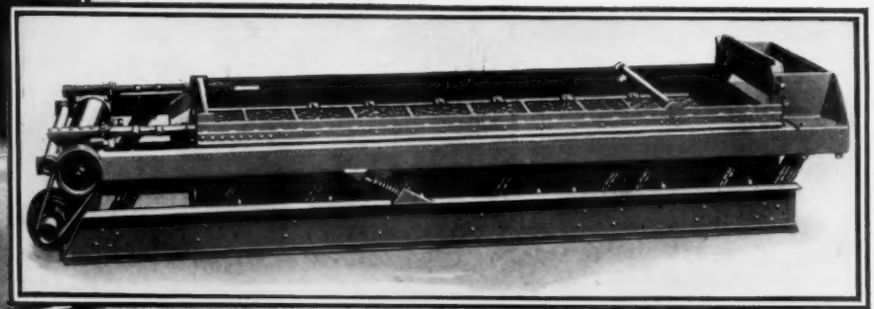
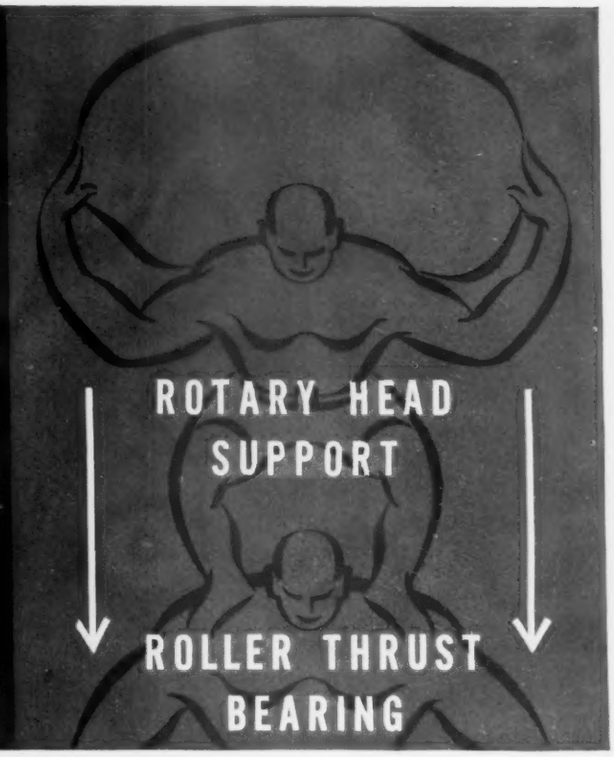
Milwaukee, Wis.

New York City	London, Eng.	Los Angeles
60 E. 42nd St.	Bush House	846 Subway Terminal Bldg.

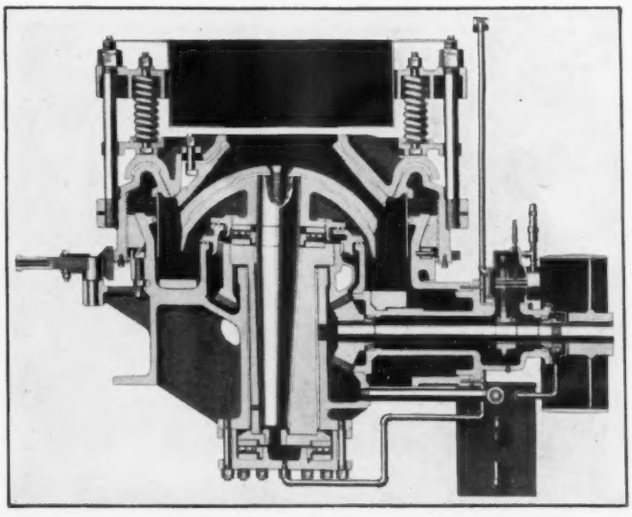


CRUSHERS - SCREENS

Takes the HEAVY LOAD where it belongs



How? Radial pressures are reduced; and vertical pressures are increased. The spherical shape of the crushing head greatly reduces the lateral pressures—relieving the load on the bronze eccentric sleeves. Diverted downward—the heavy load is concentrated on the rotary head support and roller thrust bearings which are strategically designed to take it best.



This explains the low power consumption, longer life, lower upkeep and greater tonnage of the Telsmith Gyrasphere Crusher.

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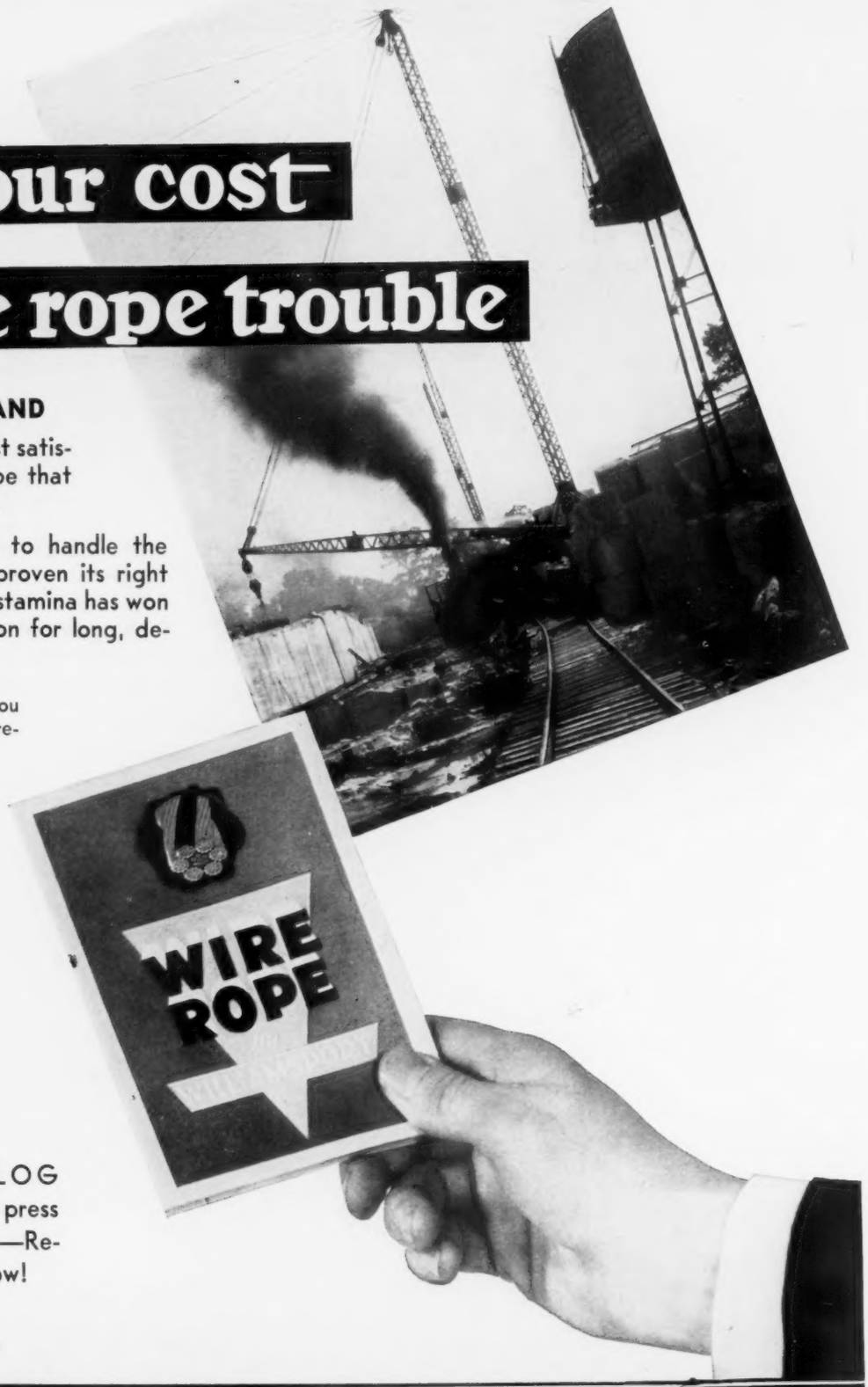

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2,500,000 Yards to move—at a profit

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— ARTHUR A. JOHNSON

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1. An impartial study and comparison of every essential detail in design and construction of five prominent shovels scored an overwhelming number of points in favor of LIMA.

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Can Get You Together

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If you want to handle additional equipment

WRITE—No charge for this service.

Are you a manufacturer who does not have adequate representatives—who is losing business because sales calls are not being made?

OR—are you a Dealer who is anxious to add to your line of equipment?

You can get together—through Pit and Quarry.

Starting with the January issue, the classified advertising columns of Pit and Quarry will be open to these two classifications—WITHOUT CHARGE.

State your wants briefly, sign your name, and send it to Pit and Quarry. Try to limit your message to 30 words or less. No blind advertisements accepted.

PIT AND QUARRY,
538 S. Clark Street, Chicago, Illinois.
Please insert the following in your new Get-to-gether Section.

.....

.....

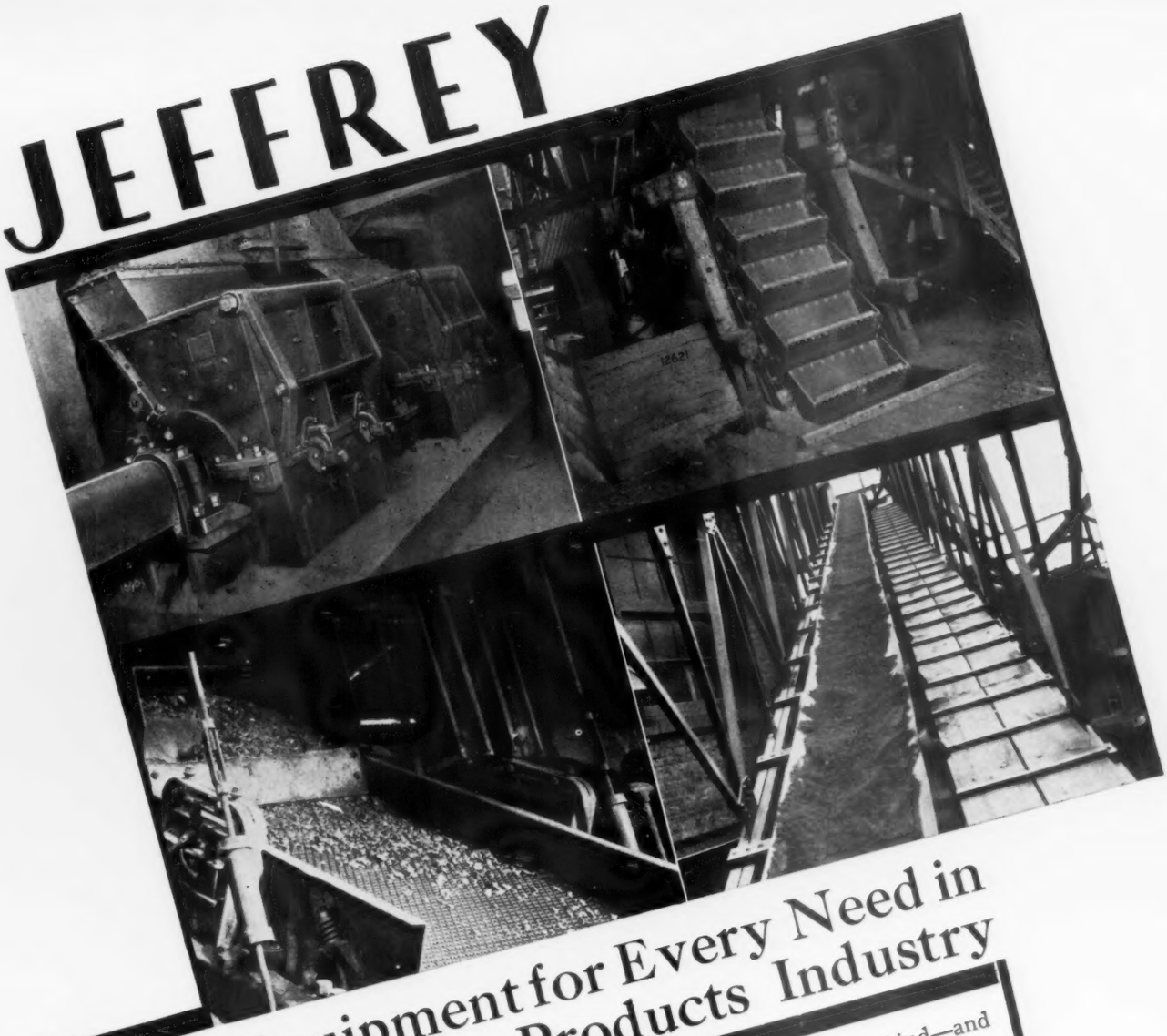
.....

My Name .....

Company .....

Street ..... City ..... State .....

JEFFREY



Equipment for Every Need in the Rock Products Industry

If you have a material handling or reduction job of any kind—and want it done quickly and economically—there is a right Jeffrey Unit to do that job correctly and without forcing the application of any type. All kinds of bulk material including: stone, gravel, sand, cement, lime, gypsum, and similar products are being elevated, conveyed, screened, washed, or reduced to any size—by Jeffrey Equipment. The Jeffrey Line includes: Elevators and Conveyors . Electric Vibrating Conveyors, Screens and Feeders . Crushers . Pulverizers . Portable Loaders . Sand and Gravel Handling Machinery . Washing and Screening Equipment . Coal and Ashes Handling Machinery . Chains and Attachments . Locomotives . Sand Settling Tanks . Sprocket Wheels . Gears.

Our Jeffrey Engineers will be glad to solve your handling and reduction problems. Write today.

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Jeffrey Manufacturing Company, Ltd., of Canada

Head Office and Works, Montreal—Branch Offices, Toronto—Vancouver—Calgary

Mark Your Calendar Now

for the 1936 conventions of the

National Crushed Stone Association
National Sand & Gravel Association
National Slag Association

and

National Ready-Mixed Concrete Association

in St. Louis the week of January 27

Subjects of great importance to every producer will be discussed and you can not afford to be absent. The prospect of future and state legislation affecting the conduct of your business is one of the problems which will confront all business men. Far from being a favored exception, your business—being concerned with the production of raw materials essential to nearly all types of construction—is certain to be one of those of the greatest interest to legislators and administrators who are really concerned about business recovery. The situation is one to which you can not remain indifferent and be mindful of your own interests.

Well-known speakers will discuss these problems at the meetings of your industry's trade association and it will be your privilege to participate in the discussions. You will have a voice in shaping the policies that will guide your industry throughout the year.

The joint exposition of machinery will be of unusual significance because of the great strides that have been made in developing new equipment. Your interest in production problems is second only to your interest in business and legislation problems. The exhibits will amply repay you for the time and effort involved in making the trip.

Remember the dates—

January 27 to 31, 1936

Remember the place—

Hotel Jefferson, St. Louis, Mo.

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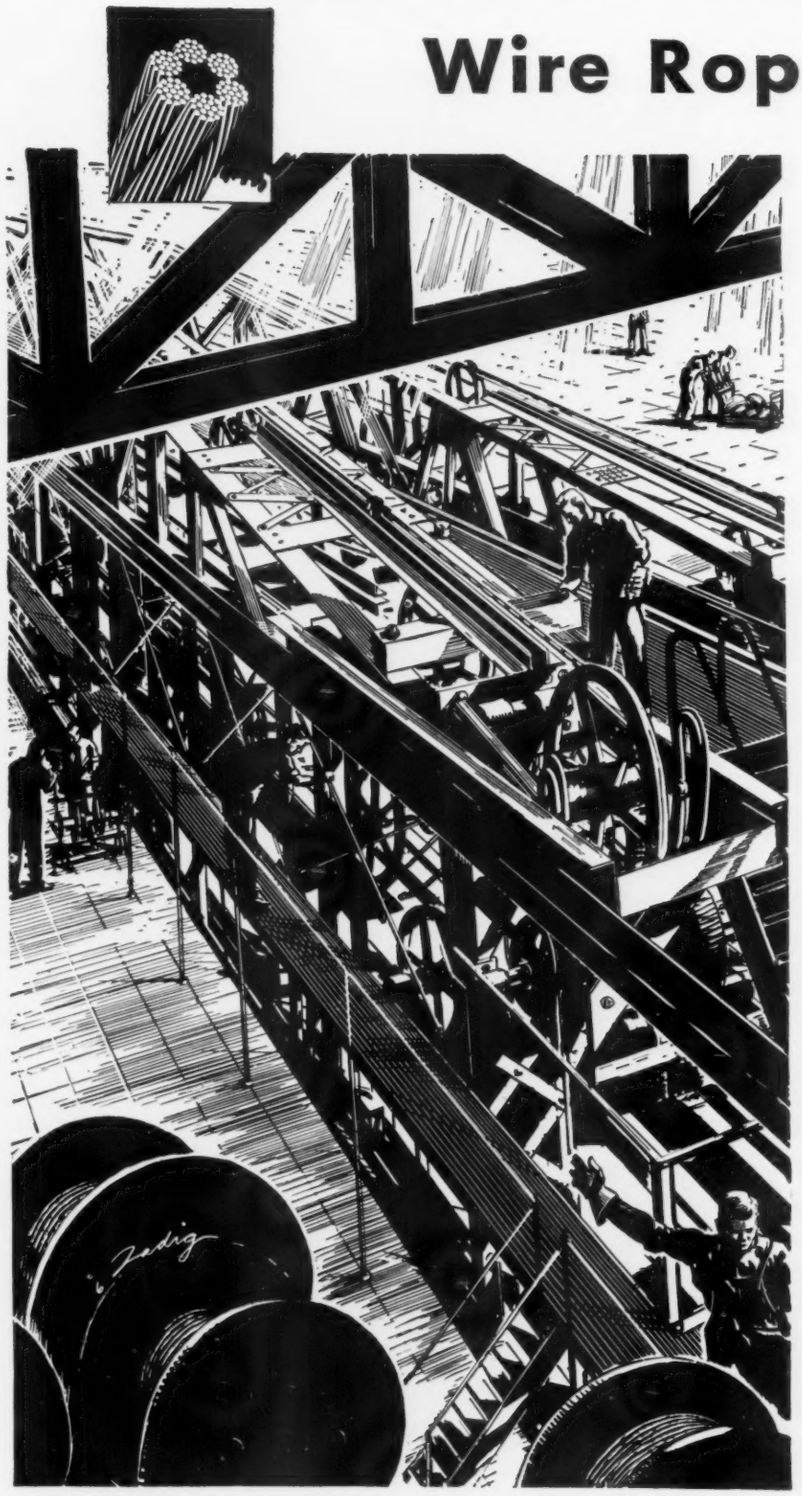
World's Champion
Wire Rope Punisher

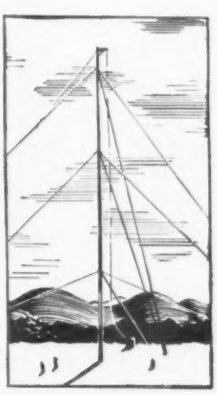


DEVELOPED BY ROEBLING FOR WIRE ROPE RESEARCH

What is this huge and complicated Roebling machine... with its maze of pulleys, belting, gears, and what not? It is a pitiless dissector of wire rope characteristics... a machine in which months of wire rope service can be crammed into days... and in which the toughest of conditions can be closely simulated.

One of several similar fatigue machines built by Roebling at various times, this unit is the largest, most elaborate, and most highly developed in existence. It is used to study the fatigue qualities of wire rope under various bending and tension conditions.

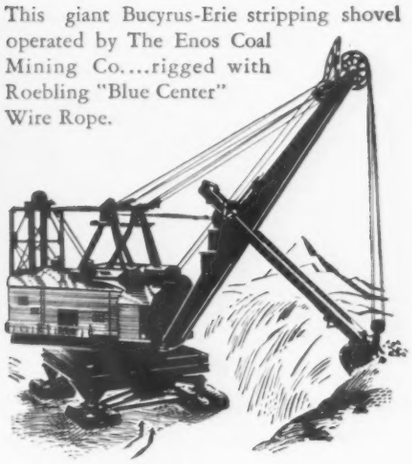
WORLD'S TALLEST TOOTHPICK



It is the new antenna of the Oregonian's radio station KEX... guyed with Roebling Cables... 3200 feet of ½" Galvanized Strand. The rigging job is claimed to be one of the most difficult ever attempted.

18 CUBIC YARDS AT A GULP!

This giant Bucyrus-Erie stripping shovel operated by The Enos Coal Mining Co.... rigged with Roebling "Blue Center" Wire Rope.

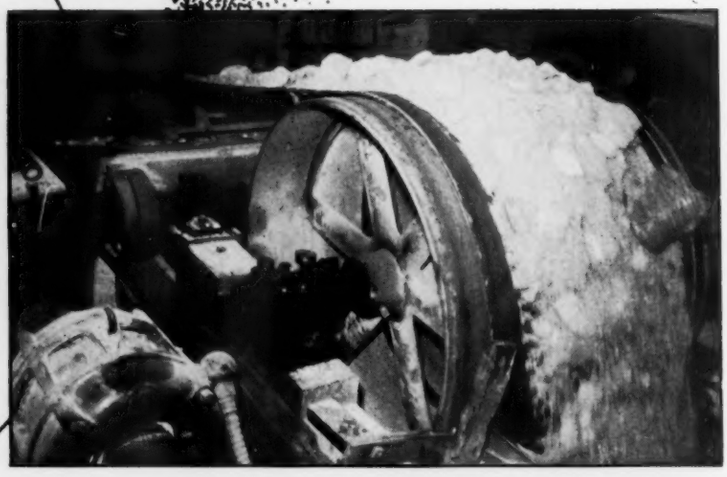


TO MAKE CERTAIN that Roebling Wire Rope will give the user the highest obtainable degree of safe, economical service, Roebling has enlisted the aid of the finest and most complete research, testing and manufacturing facilities. This fatigue machine illustrated is an example. John A. Roebling's Sons Company, Trenton, N. J. Branches in Principal Cities.

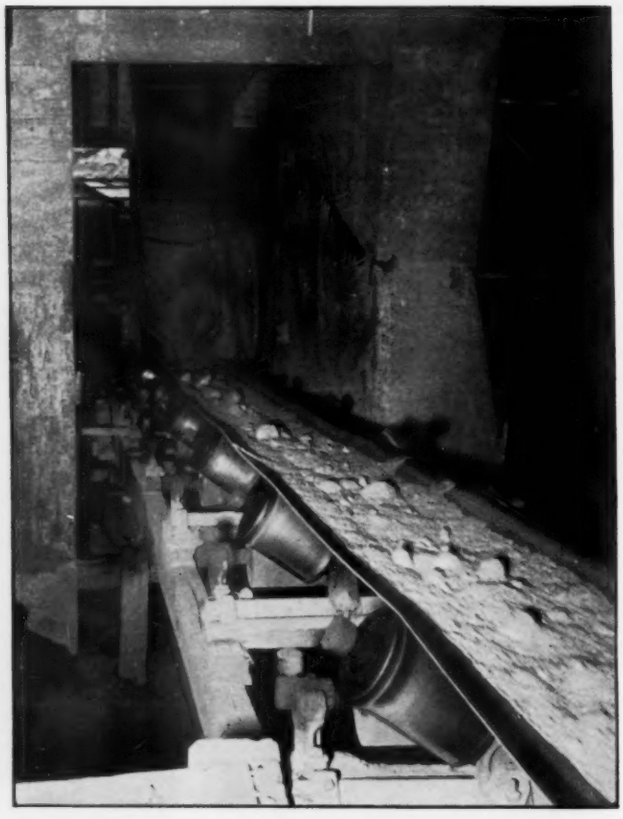
ROEBLING ...THE PACEMAKER IN WIRE ROPE DEVELOPMENT

REPUBLIC

Conveyor BELTS



. . . KEEP QUARRY OPERATING COSTS AT A MINIMUM



● Our field engineers are conscientious in their efforts to make every application of Republic Conveyor or Elevator Belting a means of reducing operating costs. This necessitates that each installation be looked upon as a new and individual problem. Engineering knowledge, as applied to quarry and sand pit operations, has constantly increased and today's standards of efficiency are higher than those of several years past.

Conveyor and elevator belt quality must always be judged from the standpoint of the work to be performed. The belt must fit the job with relation to maximum capacity, size and character of material, and many other factors which dictate the type of construction required. Republic manufactures several grades and you may refer to the nation's largest aggregates producers for proven evidence of their economy and long endurance on carefully planned operations.

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VOLUME 28 NUMBER 6

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, DECEMBER, 1935

1936 Gravel, Stone, Slag Programs Ready

MEETINGS BEGIN JANUARY 27

The 1936 conventions of the National Crushed Stone Assn., National Sand & Gravel Assn., and National Slag Assn. will be held concurrently at Hotel Jefferson, St. Louis, Jan. 27-30. The joint machinery exhibition will be held at the same time. The three organizations are to hold a special joint session under the auspices of the Mineral Aggregates Institute on January 29, at which time there will be a number of important speakers. The daily sessions are summarized as follows:

Monday, January 27. National Crush Stone Assn. will formally open its convention at 10 o'clock with an address by Russell Rarey, president, to be followed by reports on business conditions in 1935 and outlook for 1936. A. T. Goldbeck, director of the Bureau of Engineering, will be the chief speaker, with a special report on an investigation recently conducted into the stability of bituminous road mixes. A "greeting luncheon" is scheduled for 1 p. m. In the afternoon session "New Developments in Concrete Road Design" will be the principal subject. In the evening will take place the formal opening of the Joint Machinery Exposition, conducted by the Manufacturers' divisions of the National Sand & Gravel Assn. and the National Crushed Stone Assn. An informal reception will precede the opening. The displays are expected to be among the best in recent years.

Tuesday, January 28. The morning session of the crushed stone convention will be a symposium of "Stabilized Roads," conducted by three speakers of recognized reputation. H. S. Fairbank, chief Division of Information, U. S. Bureau of Public Roads, will give the concluding address. The formal opening of the convention of the National Sand & Gravel Assn., will take place on this date, preceded by the meeting of the board of directors on the day before. After the presentation of reports there will be a general discussion of conditions in the industry, led by the following: Paul P. Bird, Boston, Mass.; J. C. Buckbee, Los Angeles, Calif.; Chas. M. Cadman, San Francisco, Calif.; H. P. Caldwell, Louisville, Ky.; O. J. Ellingen, Mendota, Ill.; Alex. Foster, Jr., Philadelphia, Pa.; C. Gray, Indianapolis, Ind.; M. G. Kerr, Detroit, Mich.; Lee T. McCourt, Memphis, Tenn.; John Prince, Kansas City, Mo.; Robt. J. Potts, Waco, Texas; G. G. Robinson, Toronto, Canada; Harris N. Snyder, Buffalo, N. Y.; Stephen Stepanian, Columbus, Ohio, and Ray V. Warren, Pittsburgh, Pa. In the afternoon there will be no convention sessions, the time having been given over to inspection by members of the machinery exhibits.

Wednesday, January 29. Under the auspices of the Mineral Aggregates Institute the three associations will hold a joint session, in the form of an open forum, presided over by Otho M. Graves, chairman of the Board of Governors of the Institute. The speakers include John C. Gall, representing the National Association of Manufacturers, in an analysis of social security and labor legislation; Col. H. B. Hackett, assistant administrator, Federal Emergency Administration of Public Works, on "The Function of Federal Public Works in the Stimulation of Industrial Recovery"; Abram F. Myers, former member Federal Trade Commission, and Col. Willard T. Chevalier, vice president McGraw-Hill Publishing Co. Discussions will follow each speaker's address, and at 4 o'clock there will be a general discussion of the program and the activities of the Mineral Aggregates Institute. A joint dinner will finish the day's sessions.

Thursday, January 30. Final sessions of all three conventions will be held and devoted to the transaction of business, the election of officers, etc. In the Crushed Stone convention awards will be presented in the safety contest. Special entertainment programs have been provided for the ladies attending by all three associations.

Friday, January 31. The sixth annual convention of the National Ready Mixed Concrete Association will be opened the next day following the conclusion of the other conventions. The program is to be announced later.

Seattle Firm Lands Big Coulee Dam Cement Job

The Superior Portland Cement Co., Inc., Seattle, Wash., has been awarded a contract for 2,000,000 bbl. of cement for the Grand Coulee Dam. President E. P. Lucas has stated that enough cement is ready for the first big shipment. The Seattle and Concrete plants will supply the cement and at least 80 men will have steady employment at the Concrete plant for two years.

Alabama Firm Installs Modern Steel Equipment

★ Installation of hoppers, bins and chutes for the Longview-Saginaw Lime Works at Saginaw, between Birmingham and Montgomery, Ala., and 35 tons of steel equipment to expedite the handling of lime and other products, has been announced.

New England Plant Adds New Crushing Equipment

★ A 32B Telsmith reduction crusher has recently been installed at the plant of the Manchester Sand, Gravel & Cement Co., Manchester, N. H.

F. H. A. Loans in First Year Top $228,000,000

600,000 IN FEDERAL CREDIT PLAN

Financial institutions with contracts of insurance with the Federal Housing Administration reported 21,276 loans under the Modernization Credit Plan, totaling $6,911,976 for the week ending Nov. 23. This brought the total loans reported since the start of the modernization program in August, 1934, to 601,107, valued at $219,456,935.

Financial institutions also reported 1,602 mortgages selected for appraisal under the long-term "Single Mortgage System" totaling $6,198,652. The total number of mortgages reported since the start of the program last December was 59,116, valued at $228,312,370.

The estimated total volume of modernization and repair work developed by the program, but not entirely financed under its terms, reported by field offices of the Housing Administration during the week ending November 23, was $29,812,433, bringing the estimated total work created since August, 1934, to $1,088,661,799.

Wabash Cement Installs Slurry Filters at Osborn

★ The Wabash Portland Cement Co. has installed in its Osborn, O., plant four slurry filters made by Oliver United Filters, Inc. Each of two 11-ft. 3-in. by 175-ft. kilns has been equipped with two 12½-ft. 6-disk filters. Operation began about Sept. 1.

California Cement Plant Damaged by $60,000 Fire

Fire of undetermined origin caused $60,000 damage at the Yosemite Portland Cement Company plant near Merced, Calif., Nov. 1. Two thousand barrels of cement, 160,000 empty sacks and business records of eight years were burned. The offices and storage room were destroyed as the steel building collapsed from the heat. The loss was covered by insurance.

★ Seybold Bros., Dunkirk, N. Y., have completed the construction of a new aggregates plant using Webster and Good Roads equipment.

Federal Appropriations for Highway Building

NEARLY $900,000,000 IN SIGHT

In addressing the National Corrugated Pipe Assn., meeting at the Palmer House, Chicago, on Oct. 11, on the subject, *What Federal Appropriations May the Highway Industry Expect?* Charles M. Upham, engineer-director of the American Road Builders' Assn., set $890,550,000 as the approximate amount in Federal appropriations that may be hoped for by the highway industry for the next fiscal year. This includes $125,000,000 provided for by the Hayden-Cartwright Act of 1934 to be matched by amounts from the various states. Mr. Upham estimates that these state appropriations should total $465,550,000 and that farm-to-market roads should have at least $200,000,000 a year. He also believes that municipalities can use $100,000,000 in Federal funds on streets that are an integral part of Federal-state highways. This is a program that it is possible to finance and carry into operation immediately if it is authorized.

This total would provide Federal funds equalling about what is being collected in gasoline taxes and motor vehicle registration fees, and a campaign for that amount can be maintained successfully if states and local governments will bring an abrupt end to the diversion of highway revenues.

State programs have been approved for Alabama and Michigan; some 30-odd programs have been approved by the Bureau of Public Roads, but not by the President, whose approval is necessary before the money is set up. Of the utmost importance to the highway industry to-day is the question of how much sound, efficient construction can be launched before Congress and the state legislatures meet again and turn to the subject of highway finances.

Stewart Sand & Material Co. Installs New Plant

★ Stewart Sand & Material Co., of Kansas City, Mo., have installed a Hetherington & Berner bituminous plant, including mixing tower, bin, weigh box, dial scales and asphalt bucket.

Penn-Dixie Cement Corp. in Perfect Safety Record

The Penn-Dixie Cement Corp. plant at Portland Point, N. Y., has attained a record of perfect safety for the past four years and has been re-awarded the Portland Cement Assn. safety trophy. This trophy was originally presented five years ago, commemorating one year of perfect safety, but in 1931 the record was marred. Beneath the plaque is the inscription: "Reawarded for perfect safety record in 1932, 1933, 1934."

The presentation was made by R. B. Fortuin, safety engineer of the Portland Cement Assn. and the acceptance by Supt. Floyd P. Werner. Other speakers were Supt. Wilson Roth of Plant 6 at Nazareth, Pa.; General Manager W. H. Klein; and David B. Fortuin, office manager of the Portland plant.

New Cooler is Installed by Calaveras Cement Co.

★ The Cement Mill Equipment Co., Detroit, Mich., has just completed the installation of a cooler at the San Andreas, Cal., plant of the Calaveras Cement Co.

Former Cement Official is Held in Fraud Charge

An indictment, charging that E. J. Burke, former president of the National Portland Cement Co., El Paso, Tex., allegedly misrepresented operation of the company's white-cement plant at Chubbuck, Cal., when he obtained a loan of $6,000 from Mrs. Hallie B. Robinson of El Paso, was returned by the September term grand jury.

More than one hundred El Pasoans have invested in the white cement company. In December, 1933, the state filed suit to cancel the company's charter. The company has no connection with the National Portland Cement Co. of Brodhead, Pa.

Michigan Limestone Co. Repairs Steamer Munson

The steamer "Munson," owned by the Michigan Limestone & Chemical Co., Rogers City, Mich., has recently been improved. Due to increasing the length of the unloading boom from 155 to 185 ft., it was decided to substitute ball-bearing sheave assemblies for the old friction type, necessitating less power for raising the 185-ft. boom than was formerly required. The old steam swing engines were replaced by electric swings. All connections at the top were arc-welded for greater strength, thus reducing strain on the A-frames. A d.-c. turbo-generator set was installed in the engine room, replacing the reciprocating steam generator set. New chute liner plates were installed in the chutes from hold conveyors leading to the elevator. Approximately 3,600 man-hr. of work were successfully performed in 5 days, with a record of no accidents.

★ The Hardinge Co. of York, Pa., has recently installed a 4-ft. by 10-ft. classifier for washing salt crystals at the plant of the Carey Salt Co., Hutchinson, Kan.

Severence Tax Up for California Assembly

GOVERNOR MERRIAM CONSIDERS

Gov. Frank F. Merriam of California is considering submitting a severance tax bill to the special session to be held in January and has instructed Assemblyman C. R. Kallan and his committee to study the subject and submit a complete report by Jan. 1. A levy of from 2 to 4 per cent. on products of the soil—cement, brick, oil, minerals and timber—would raise an estimated $40,000,000 biennially.

Allegheny Sand Firm Gets Dam Gravel Order

★ The Allegheny River Sand Corp., Kittanning, Pa., will furnish the sand and gravel necessary in the construction of Lock and Dam No. 9, which is being dredged in the Allegheny River. Construction of a storage yard, providing storage for 50,000 tons of material, has been completed. A crawler crane has been installed to remove sand and gravel from barges and load it in cars for transfer to the site of the dam.

Coulee Dam Material Ready for Shipment

One of the first contracts in the Pacific Northwest, in connection with the recent large cement order for Grand Coulee Dam, is that of 400,000 bbl. received by the Spokane Portland Cement Co., Spokane, Wash., from the U. S. Reclamation Bureau at Denver, according to Vice-president Henry M. Heleniak. This amount, to be delivered in two years, will require the shipping of 2,800 car-loads of lime rock from the quarry at Powell to the plant at Irvin. Mr. Heleniak stated that the business of his company is 40 per cent. ahead of a year ago, with an increase in employment up to 85, compared with 52 a year ago.

Filtrol Corp. Erecting Plant in Jackson, Miss.

★ The Filtrol Corp., owned and operated jointly by the Filtrol Corp. of Cal. and Attapulgus Clay Co. of Attapulgus, Ga., is erecting a plant at Jackson, Miss., for the processing of Bentonite for use as a filtering material.

New Sand Company is Organized at Topeka

★ A new sand company has been organized in Topeka, Kas., by F. A. Laughead who was until recently with the Consumers Sand Co. The new company has taken over one of the old plants of the Consumers Sand Co.

Quarry Employment Off Slightly in October

CEMENT INDUSTRY SHOWS GAIN

A slight gain in employment in the cement industry was recorded for October, while in the quarrying industry employment fell off slightly.

In the latter the employment index for the month stood at 50.0, showing a decline of .1 for the previous month, and of 3.5 per cent. from October of 1934. In October reports from 1,109 quarries showed 32,797 workers employed—a .1 per cent. decrease from the September figure of 32,820 for the same number of quarries. The payroll, however, stood at $600,336 for one week, an increase of 3.3 per cent. over the payroll of September of $581,367 for the same period, and of 13.7 per cent. over that of October, 1934. Per capita weekly earnings for September stood at $17.60, a loss of .6 per cent. from the previous month, and a gain of 16.4 per cent. over September, 1934. The average hours worked per week for September declined 1.1 per cent. from August, to 37.3, but showed an increase of 11.7 per cent. over the figures of September, 1934, while average hourly earnings for September stood at 47.1, a decline of .2 per cent. from August and of 1.7 per cent. from September in the year before.

EMPLOYMENT AND PAYROLLS IN THE QUARRYING AND CEMENT INDUSTRIES, BY MONTHS

Mo.	Quarrying and Non-metallic Mining			Cement		
	Plants Reporting	Employees	One-Week Pay-Roll	Plants Reporting	Employees	One-Week Pay-Roll
Sept	1109	32,820	$581,367	132	18,734	$375,918
Oct.	1109	32,797	600,336	132	19,097	374,824
Ch'ge	.....	—0.1%	+3.3%	.....	+1.9%	—0.3%

The employment index in the cement industry rose 1.9 per cent. from 51.9 in September to 52.9 in October, as against 50.7 for the same period in 1934. Reports from 132 plants in October showed 19,097 employees as against 18,734 in September, a gain of 1.9 per cent.—and a one week payroll of $374,824 as against $375,918 in September, a loss of 0.3 per cent. Per capita weekly earnings for September were $20.10, a gain of 2.1 per cent. over August, and 8.2 per cent. over September a year ago. The average hours worked per week for September was 35, a loss of 0.3 per cent. from August, and a gain of 6.5 per cent. over the previous September. The average hourly earnings for September 57.3c, which represented a gain of 2.1 per cent. over August, and of 1.3 per cent. over September, 1934.

Farmer's $25,250 Suit Hits at Cement Dust

Papers in the $25,250 suit of Howard L. Batdorf against the Wabash Portland Cement Co., Osborn, O., have been filed in the Federal court, Dayton, O., upon motion of the cement company, following removal of the suit from Greene County Common Pleas Court, where the action was originally filed. Batdorf, a farmer, charges that cement dust and smoke from the plant reduce the size and value of his crops, besides causing him great personal inconvenience.

Louisville Stone Plant Crushes 700 Tons a Day

The Louisville Crushed Stone Co., Louisville, Ky., owned by Ralph Rogers and managed by Frank Lanham, is crushing 700 tons of stone each day in its new plant. This organization has constructed its own roads, a fine office building, a large garage in which many trucks are housed, and warehouses. The company also produces agricultural limestone.

WPA to Open Quarries in LaCrosse County

The Works Progress Administration intends to open 25 or more stone quarries in La Crosse County, Wis. These would be used to furnish crushed rock for farm-to-market highway construction. Some 250,000 cu.yd. of material will be required.

Lehigh Cement Plans Plant Near Ocala, Fla.

The Lehigh Portland Cement Co. is seriously considering the construction of a new plant in Marion County, near Ocala, Fla., on the route of the trans-Florida ship canal. The company's property, which consists of limestone and clay deposits, is located north of Ocala, comprising 1919 acres of land near Anthony, Burbank and Fort McCoy.

St. Louis Lawyers Fight Silicosis Barratry Suit

Four St. Louis attorneys heard barratry charges aired in connection with silicosis damage suits, as well as litigation against concerns in other industries, during the last month. As previously announced in PIT AND QUARRY, the men undergoing disbarment proceedings before John S. Farrington, special commissioner of the Missouri Supreme Court, are Everett Hulverson, Robert L. Pribble, Eugene J. Schmick and Francis O. Curran.

In the barratry cases against Otis M. Gallant and Marion J. Hannigan, also of St. Louis, to which reference was made in the October issue of PIT AND QUARRY, it is understood the hearing will be held in January before Derwood E. Williams, of Troy, Mo., special commissioner for the St. Louis Court of Appeals.

Mineral Output Worth $237,374,709 in 1934

CEMENT REACHED $12,445,616

Compilation of final returns from the mineral producers of California for 1934 by the statistical section of the Division of Mines, Department of Natural Resources, under the direction of Walter W. Bradley, state mineralogist, showed the total value for the year to have been $237,374,709, being an increase of $30,885,651 over the total of 1933, which was $206,489,058.

Of the structural materials, cement increased from 7,284,031 bbl., worth $10,331,395, to 8,936,085 bbl., valued at $12,445,616; miscellaneous stone from a total value of $6,871,580 to $7,131,330; and granite, lime, magnesite, bituminous rock and sandstone also showed increases for the year. Decreases were registered by marble (including onyx and travertine) and slate.

France Stone Co. Gets Road Contract in Ohio

Plans for improving 110 mi. of roads in Lucas County, O., at a cost of $524,000, under WPA, have been announced by the county commissioners. It was also stated that William B. Schmuhl, WPA director, had approved the county's contract for purchase of crushed stone from the France Stone Co., Toledo, O., believing that the superiority of the company's stone over that from the city quarry would mean an eventual saving. Mr. Schmuhl had previously stated that the price of stone quoted by the France company was too high. The France price was 65 c. a ton for stone quarried by WPA labor and varied from 90 c. to $1.10 a ton for stone quarried by its own employees.

Begins Development of Texas Gravel Deposits

★ The Fort Bend Sand & Gravel Co., Houston, Tex., has been incorporated to develop sand and gravel pits in the Brazos River in the vicinity of Richmond and Rosenberg, according to an announcement by W. M. Kennon of the Navarro Oil Co., who will serve as vice-president and treasurer of the new concern. The other officers are: R. W. Rogers, president, and T. L. Bauer, secretary. The company will begin immediately the development of two gravel pits and one rock quarry. Approximately $6,000 worth of equipment has already been purchased.

★ A Traylor Eng. & Mfg. Co. gyratory crusher has recently been purchased by the Metropolitan Water District of Los Angeles, Cal.

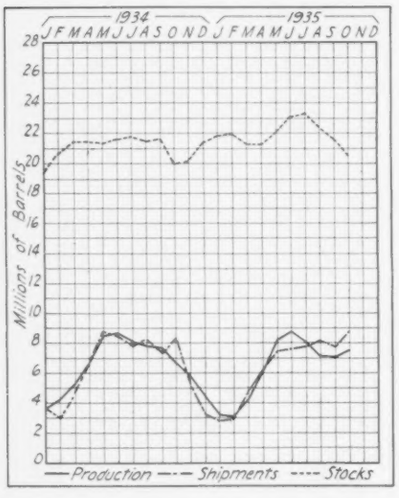
October Shows Gain in Cement Shipments

STOCKS 2.6 PER CENT HIGHER

The Portland cement industry in October, 1935, produced 7,510,000 bbl., shipped 8,794,000 bbl. from the mills, and had in stock at the end of the month 20,498,000 bbl. Production and shipments of Portland cement in October, 1935, showed increases, respectively, of 12.5 and 4.2 per cent. as compared with October, 1934. Portland cement stocks at mills were 2.6 per cent. higher than a year ago.

The mill value of the shipments—55,651,000 bbl.—in the first nine months of 1935, is estimated as $85,203,000.

According to the reports of producers the shipments totals for the first nine months of 1935 include approximately 1,553,000 bbl. of high-early-strength Portland cement with an estimated mill value of $2,977,000.



Cement production, shipments and stocks to October, 1935.

Included in the shipments, which represent all types of Portland cement, are approximately 1,553,000 bbl. of high-early-strength cement, with an estimated mill value of $2,977,000 reported as manufactured at 46 of the Portland cement plants located as follows: One each in Alabama, Kentucky, Maine, Missouri, Oklahoma, Tennessee, West Virginia, and Wyoming; two each in Colorado, Illinois, Indiana, Iowa, Michigan, and Washington; three each in Ohio and Texas; four each in Kansas and New York; five in California; and seven in Pennsylvania.

Industry Can Regulate Itself, Say Machine Men

Evidence of the capacity of industry to regulate itself, not only in maintaining high standards of working conditions, but also in matters of fair competition is contained in the report on Trade Practice Standardization made during the month by the advisory committee of the Machinery and Allied Products Institute to its 1,000 manufacturer members.

"The machinery industry has long recognized that manufacturers, workers and customers all would benefit if general principles for standardization were recognized and followed," said Philip M. Morgan, treasurer of Morgan Construction Company, Worcester, Mass., chairman of the committee.

"Suggestions we have drawn up apply to such cost variables in manufacturing and marketing as cost accounting systems, contract forms, and handling of patterns, jigs and working drawings. They will help remove destructive factors now leading to business losses and consequent uncertainty of employment."

Mr. Morgan pointed out that the machinery industry has made progress toward recovery since the restrictions and rigidities of codes under NRA were abolished last May, and that the Machinery Institute has expressed itself as opposed to the revival of the NRA in any form.

$1,216,640 Contracts at Fort Peck Dam Awarded

The U. S. War Department on Oct. 15 approved a contract aggregating $662,500 for furnishing gravel for the Fort Peck Dam in Montana to the Becker County Sand & Gravel Co., Detroit Lakes, Minn., and the J. L. Shiely Co., St. Paul, Minn. A $554,140 contract for furnishing coarse aggregate and sand for the Fort Peck Dam was awarded to the Shiely company.

$937,866 for Highways in 9 Illinois Counties

Ernst Lieberman, chief highway engineer of the State of Illinois, has announced that contracts for $937,866.78 worth of highway work in nine counties, which are for the construction of 24.49 mi. of pavement, have been awarded by the State Highway Division.

$50,000 Fire Damages Saugus, Mass., Plant

The large new storage house of the Malden Crushed Stone Co. on the Newburyport Turnpike in Saugus, Mass., near the Malden line, was leveled by fire, ruining valuable machinery and causing damage estimated at $50,000.

Magnesite Deposit May Bring Treating Plant

It is reported that the California Chemical Co. of San Francisco has started work with a crew of eight men to survey the magnesite deposit at Eagle Pass in the vicinity of Needles. If the deposit is found to be of sufficient quantity, it is understood that a treating plant will be erected and the deposit extensively developed.

A contract has been awarded for razing the buildings and salvaging the equipment of the Bellevue, Mich., plant of the Alpha Portland Cement Co., which ceased operation about five years ago.

Expect Early Action on Gypsum Merger

UNIVERSAL OUT OF BANKRUPTCY

Merger of National Gypsum Co. of Buffalo, N. Y., and Universal Gypsum & Lime Co. of Chicago by the first of the next year became a strong probability during the latter end of November, as the result of a final decree in the Federal Court at Chicago discharging Universal from bankruptcy.

Until August 15, 1937 was allowed stockholders of Universal in which to exchange their stock for new in accordance with the reorganization plan. Holders of the new Universal stock meanwhile will receive National Gypsum stock. More than 80 per cent. of the new Universal stockholders have already agreed to this exchange.

Steps will be taken to list National Class A stock on the New York curb after the merger is completed. Also, it is expected, following the rebuilding and consolidation of the physical properties of the merged companies, National will undertake a financial readjustment that will eliminate its debentures.

Citizens Investigate Quarry Dust Nuisance

A committee has been appointed by the city council of El Cerrito, Cal., to investigate the complaints of residents in the vicinity about the dust nuisance caused by the Hutchinson Co. quarry. Efforts are being made to devise some plan that will keep the plant in operation and local men employed.

Contractors Must Pay, Says Oregon Land Board

The State Land Board of Salem, Ore., recently decreed that highway contractors are to have no more free sand and gravel. It rescinded all orders permitting the non-payment of royalties of 10 c. a cu. yd. on materials taken from the beds of navigable streams.

Santa Cruz Starts Kiln To Keep its Men at Work

In order to avoid discharging some 15 or 20 men, whose services would otherwise have been unnecessary, the Santa Cruz Portland Cement Co. at Davenport, Cal., has put another kiln in operation, making a total of five that are running.

Explosion Leads G-Men To Find Whiskey Still

When Federal agents arrested James Harden, sought in connection with a dynamite explosion at the plant of the Standard Lime & Stone Co., Martinsburg, W. Va., they not only apprehended Harden, but discovered two big stills, several thousand gallons of mash and some whiskey. Four men were held on charges of operating the stills.

New Silicosis Law Burden to Employers

SOME DEFECTS ARE DISCLOSED

The lack of limitations under the new paragraph 28, added by the recent New York legislature to the New York Workmen's Compensation law, and effective Sept. 1, last, has aroused interest in industries affected in all parts of the country. The absence of an exact definition of occupational disease, and the statement in the amendment that it shall be characteristic of the employment and peculiar to and incident to the work of the employee, leaves its scope undetermined, except as it will have to be developed gradually through decisions on individual claims arising under it.

This is the opinion of Arthur G. Smith, assistant general manager of the Compensation Insurance Rating Board of New York. Under the amendment as enacted, he says, the original law was extended to include "any and all occupational diseases" in "any and all employments enumerated," and the only limitation on this extension is a provision that it does not apply "to any case of occupational disease in which the last injurious exposure to the hazards of the disease occurred prior to Sept. 1, 1935."

Mr. Smith calls attention to another bill, passed by both branches of the same New York legislature that adopted the amendment already indicated, but subsequently vetoed by the governor. This bill defined dust diseases and separated them into two stages; provided a definite and limited scale of benefits for disability or death, as well as a change of employment benefit for employees suffering from dust disease in the first stage, but permitted such an employee to continue in his dusty occupation if he waived his right to full compensation and agreed to accept reduced benefits in the event of disability thereafter.

The casualty insurance company and employers alike entered opposition to this proposed measure, according to Mr. Smith. Most objections were based on the fear that immediate liability, which it imposed upon the employer, was uninsurable, due to the fact that the bill would have been retroactive, and would have tended to precipitate the filing of claims, if it did not serve to destroy employee *morâle* entirely.

"However," continues Mr. Smith, "it is obvious that many of the objections raised against the vetoed dust-disease bill apply with equal force against the 'all-inclusive' bill which did become law. The latter also is retroactive in its effect, and imposes a heavy burden upon employers because of past occurrences. The issue of accrued liability still exists. But since the law does not require official medical examinations of all employees and certification of disability where found, it is probable that claims under the existing law will not be abnormally precipitated, but will arise only when an employee actually becomes unable to carry on his usual work.

"The question of coverage for and rating of the occupational dust-disease hazard is by no means solved. Objections that several of the rates are too high, are being received from many New York state employers. On the other hand, private carriers generally seem reluctant to carry risks having serious dust hazards at the approved rates, and thus complicate the burdens of the employers. The relativity of rates for the several classifications will undoubtedly require considerable correction. It will be necessary to determine the true cost of covering this hazard as actual experience under the amended law develops."

Lima's Long Stone Co. Rebuilding Its Plant

★ The Long Stone Co., Lima, O., is rebuilding its plant, which was badly damaged by fire. Three crushers and a Diesel engine and generator were saved. The new equipment includes conveyors and a 4-deck vibrating screen.

Hannibal Plant Is Awarded Certificate

In recognition of its record of 365 days without a lost-time accident the Hannibal, Mo., plant of the Universal Atlas Cement Co. has been awarded a certificate by the Portland Cement Assn. Spurred by their excellent record of the past year the employees are now determined to win a safety trophy, the highest award the cement association makes in the campaign for accident prevention.

Fitchburg Concern Is Planning Plant Move

The J. P. Keating Co., Fitchburg, Mass., is planning to move its plant to another location in the vicinity, for which two second-hand crushers have been purchased. A type D. & E. asphalt plant, which is being constructed by Dance in Boston, will shortly be added.

Western Indiana Firm Leases Additional Pit

The Northern Indiana Sand & Gravel Co. pit at 501 S. Wenger Ave., South Bend, Ind., has been leased to the Western Indiana Gravel Co. for a period of five years. The local company was founded seven years ago. The new firm controls eight similar plants.

★ A three-fourth cu. yd. shovel has been installed at the Jackson, O., plant of the Jackson Sand Mining Co. The machine is a type 302, made by the Lima Locomotive Works, Inc.

Southwest Road Show at Wichita Feb. 25-28

PLAN FOR EDUCATIONAL EXHIBIT

The Ninth Annual Southwest Road Show and School, held under the auspices of the Wichita Thresher and Tractor Club, Inc., will take place at the Coliseum, Wichita, Kan., Feb. 25-28, 1936. The educational exhibits in connection with the Good Roads School will be directed and supervised by the Kansas State Highway Commission and the Engineering Department of the Kansas State College of Agriculture, coöperating with state and federal highway engineers, the U. S. Bureau of Public Roads, colleges and universities, and will be displayed on the entire second floor of the exposition building. Admission to the public is free.

Alpha Jamesville Plant Wins P. C. Safety Trophy

The Jamesville, N. Y., plant of the Alpha Portland Cement Co. was presented with the Portland Cement Assn. trophy on Oct. 11. This was awarded to the plant in recognition of its perfect safety record during the past two years.

Canadian Firm Plans Expenditure of $50,000

★ The expenditure of $50,000 is planned by the Rockwood Corporation of Canada, Ltd., St. Davids, Ont., Can., for the construction of a plant to manufacture insulating material from rock.

Files Suit Alleging Excessive Dynamiting

Damages of $5,000 and an injunction against the excessive use of explosives in quarrying are the basis for a civil action recently filed by Frederick C. Bauby of Waterbury, Conn., against the Connecticut Quarries Co. and the New Haven Trap Rock Co. Mr. Bauby claims the defendants' agents, while blasting in Cheshire, did damage to his property on the Waterbury-Cheshire Road.

Tygart Limestone Installs New Diesel

★ The Buckeye Machine Co., of Lima, O., recently installed a 300-hp. Diesel engine at the plant of the Tygart Limestone Co. of Lawton, Ky., replacing purchased power. The engine drives a large generator through a V belt and a large air-compressor is driven through a flat belt.

★ The H. L. Seabright Co. of Wheeling, W. Va., has purchased a special 1-cu.yd. Owen bucket.

★ Three Blaw-Knox truck mixers have been sold to the Lake Shore Coal & Supply Co., Cleveland, O.

October Building In $200,000,000 Record

HOMES COST OVER $55,000,000

Partly because of private activity, partly because of the momentum of the WPA program, the construction industry has begun to improve. For October the volume of construction undertaken in the 37 eastern states totaled $200,863,700 according to F. W. Dodge Corp. This was the highest monthly volume reported since that shown for December, 1933, which, incidentally, was the month of peak undertakings of the original PWA program.

Excluding December, 1933, one must go back to the records of the Autumn of 1931 to find construction totals larger than the one turned in during October. That month's record compares with $167,376,200 for September and was almost 50 per cent. greater than the total of $135,224,800 reported during October, 1934.

For October the residential total, as apart from other classifications, amounted to $55,100,300 in the 37 eastern states. This was more than twice the total of $26,299,800 for October of last year and represented a gain of more than 30 per cent. over the September, 1935, total. For the ten-month period ended October residential building amounted to $394,007,800 as against $214,379,900 for the first ten months of 1934. Practically all of this 84 per cent. gain was due to private building as distinguished from housing construction of public agencies.

Non-residential building awards during October in the 37 eastern states amounted to $59,448,400 as against $49,420,100 for September and only $43,685,600 for October of last year.

Heavy engineering jobs, embracing both public works and public utilities, amounted to $86,315,000 in October for the same area. This contrasts with $76,145,300 for September and $65,239,400 for October 1934.

For the elapsed months of 1935, the Dodge bulletin states that "total construction of all descriptions undertaken in the area east of the Rocky Mountains amounted to $1,392,561,400 as against $1,338,732,000 for the corresponding ten months of 1934."

Virginia Firm Exempted Under State Security Law

An exemption from provisions of the State Security Law has been issued by the State Corporation Commission to the Riverton Lime & Stone Co., successor to the Riverton Lime Co., Riverton, Va., in the issuance of 2,100 shares of 7-per cent. cumulative preferred stock, par $100; 250 shares of Class A, 6-per cent. preferred, par $100, and 4,000 shares of common at $1 par. W. E. Carson, A. C. Carson and C. A. Stokes are the principal officers of the corporation. Rapidly expanding business and the necessity for enlarging the company's financial structure to meet new needs were given as reasons for the reorganization.

$15,000 Improvement in Standard Slag Co. Plant

New equipment costing $15,000, is being installed at the Jackson, O., plant of the Standard Slag Co. It consists of new bins and screens, which will make possible more efficient grading and loading, and was expected to be ready by Nov. 1. It will enable the plant to produce between 600 and 700 tons daily, as compared with 400 and 500 tons at present. Plant Superintendent J. A. Strouse states that there has been a great demand this fall for slag in road construction.

Buy Crawler Type Crane for Chain of Marl Pits

William Crawford, Jr., and Guy W. Offill, Berrien Springs, Mich., have purchased a 15-ton Orton crawler type crane for digging a chain of marl pits in southern Michigan and northern Indiana.

Standard Paving Co. Builds Products Plant

A recent announcement by President I. V. Gray of the Standard Paving Co., Tulsa, Okla., states that after an almost complete shutdown of two years, its sand and stone plants are about to reopen, furnishing employment for about 100 men. The principal improvement is the erection of an asphaltic-cement manufacturing unit.

Ordinance Stops Crusher Plant Near Roscoe, Cal.

The Granite Materials Co., North Hollywood, Cal., has been denied permission to operate a rock crusher and sand plant in the vicinity of Roscoe. Mayor Frank L. Shaw of Los Angeles, vetoed an ordinance which would provide for a zoning variance that would permit the company to establish a plant near the Roscoe Community Park. Residents of the district filed vigorous protests to the rock-crusher proposal.

Installs Dust Collector for Masonry Cement

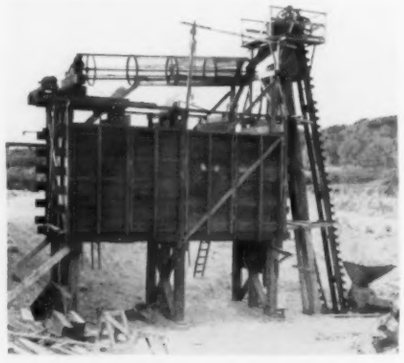
★ The Ash Grove Lime & Portland Cement Co., Chanute, Kan., has recently completed the installation of a Northern Blower Co. dust-collector in its masonry-cement department.

★ The Allied Supply Co. of Medina, O., has purchased a 3-ft. by 8-ft. Hardinge counter-current classifier for use in washing sand and removing silt and clay coating.

Basalt Rock Making New Building Block

NEW PROCESS PLANT IS BUILT

A. G. Streblow, president of the Basalt Rock Co., Inc., of Napa, Cal., announces the production of a new product, a light-weight hollow webbed concrete block called Basalite. It is made of cement and pumice in large bricks. Nails and screws can be driven into it and it can be sawed; it has a structural strength of 1,600-lb. to the sq. in., is fireproof, has a high degree of insulation against heat and cold, and is said to be a very good base for plaster and stucco. At present 3,000 blocks are being turned out daily and shortly the plant will be equipped to produce 10,000 blocks daily.



New pumice crushing and screening plant of Basalt Rock Co.

The pumice used in the manufacture of these blocks is obtained from a deposit at the site of the company's crushed stone plant on the outskirts of Napa. The deposit underlies the entire plant site and a plant has just been completed to crush and screen this material to the desired fineness. The deposit is hand drilled and blasted and then hauled by a LeClair scraper to the plant. A small ring-roll pulverizer breaks down the material which shatters easily on impact. A chain bucket elevator feeds to a revolving screen over the storage bins. The four sizes produced are stored in four bins with a capacity of 25 cu. yd. each. The material is then hauled to the plant where the ashlar-type blocks are made.

Rockland-Rockport Lime Co. Elects New Officers

The Rockland-Rockport Lime Co., Inc. (formerly the Rockland & Rockport Lime Corp.), Rockland, Me., has been reorganized. The new officers are: G. B. Wood, president and general manager; Fred C. Scribner of Portland, Me., secretary; H. A. Buffum, treasurer, and K. C. Rankin, superintendent and purchasing agent.

★ The American Colloid Co., Lead, S. D., has purchased a Bonnot disintegrator and mixed for breaking bentonite.

M. A. I. Publishes Its New Regulations

GOVERNORS ENDORSE PROGRAM

At a meeting of the Board of Governors of the Mineral Aggregates Institute in Washington on Aug. 20, proposed rules and regulations were decided upon for submittal to the member associations—the National Crushed Stone Assn., the National Sand & Gravel Assn. and the National Slag Assn. Action on these was taken late in September and the following rules were adopted:

ARTICLE I

The name of this organization shall be the Mineral Aggregates Institute, hereinafter referred to as the Institute.

ARTICLE II

The membership of the Institute shall be composed of the National Crushed Stone Assn., the National Sand and Gravel Assn., and the National Slag Assn.

ARTICLE III

The object of the Institute shall be to act for the National Crushed Stone Assn., the National Sand and Gravel Assn., and the National Slag Assn. on those matters in which, in the judgment of the Board of Governors, there is a community of interest warranting joint action. Those matters which can appropriately be acted upon by the Institute shall be determined by unanimous vote of the Board of Governors.

ARTICLE IV

The Institute shall function through a Board of Governors. Each member Association shall be entitled to two representatives thereon. Vacancies occurring on the Board of Governors shall be filled by the appropriate Association in such manner as it may determine. Members of the Board of Governors shall serve without compensation from the Institute.

ARTICLE V

Officers of the Institute shall consist of a chairman, an executive secretary, and a treasurer, who shall serve without compensation from the Institute. They shall be elected by the Board of Governors, and, beginning February 1, 1936, shall serve for one year or until their successors are elected. The chairman shall be chosen by the Board of Governors from its own membership; the executive secretary and the treasurer shall be elected by the Board of Governors from the paid staffs of the member associations.

ARTICLE VI

Meetings of the Board of Governors may be called at any time by the chairman, and shall be called by the chairman upon the written request of two members of the Board of Governors, but, in either case, upon due notice as hereinafter provided.

ARTICLE VII

A majority of the members of the Board of Governors shall constitute a quorum for the transaction of business. No determination of the board shall be made without the affirmative personal vote of a majority thereof, provided, however, that the said majority shall contain at least one vote from the representatives on the board of each of the member associations. However, if a quorum be present at any meeting and a majority of such quorum shall take affirmative action, such action shall be effective only when there shall be received in writing within 14 days, in the office of the executive secretary, assents thereto which added to the votes of the members present in person shall constitute a majority of the Board of Governors.

Such matters as may appropriately be acted upon by the Board of Governors by mail ballot, shall be presented by the chairman in such manner as to permit an affirmative or negative vote, and the ballot thereon shall be transmitted by registered mail to each member of the Board of Governors. Each member of the board shall return his ballot by registered mail to the office of the executive secretary for receipt within 10 days from the time such ballot was mailed. A ballot not received within 10 days shall not be counted. The officers shall meet and canvass the vote, counting all ballots received within the 10-day period, and such votes shall have the full force and effect of a vote cast at a duly called and held meeting of the Board of Governors.

"Due notice" as used herein means notice by telegraph dispatched at least three or by mail dispatched at least five business days prior to the meeting. Actual attendance at such meetings, or a waiver of notice executed in writing or sent by telegraph either before or after such meeting, shall be deemed equivalent to "due notice."

ARTICLE VIII

The chairman shall preside at all meetings of the Board of Governors, and shall be an *ex officio* member of all committees and subcommittees. He shall perform such other duties as may be delegated to him by the Board of Governors. In the absence of the chairman at any meeting of the Board of Governors, the members there present shall elect a presiding officer.

The executive secretary shall be in charge of the administrative offices of the Institute. He shall assist the chairman in carrying out the policies of the Board of Governors, and shall perform such other duties as may be delegated to him by the Board of Governors.

The treasurer shall keep full and correct accounts of the receipts and disbursements of the Institute, and shall deposit all moneys and valuable effects in the name and to the credit of the Institute in such depositories as may be designated by the Board of Governors, and shall render to the board, as it shall require, an accounting of the finances of the Institute. The treasurer shall perform such other duties as may be delegated to him by the Board of Governors.

ARTICLE IX

The Board of Governors shall adopt a budget covering the activities of the Institute, which shall be submitted to the member associations for their approval. Such budget shall not become effective unless and until approved by each member association.

Each member association shall pay $500 annually to the Institute as membership dues. Expense of the Institute in excess of $1,500 annually shall be borne by member associations in proportion to the total annual production of the members of each of the member associations.

Upon unanimous vote of the Board of Governors, the Institute may draw upon the staffs of member associations for such executive and clerical assistance as may be necessary to carry on the work of the Institute. The facilities and instrumentalities of the Institute shall be available to individual member companies of the member associations.

ARTICLE X

The headquarters of the Institute shall be located at Washington, D. C. Upon unanimous vote of the Board of Governors, the Institute may also use the offices of the National Crushed Stone Assn., the National Sand & Gravel Assn., and the National Slag Assn. in the conduct of its activities.

These rules and regulations shall become effective when approved by the member associations. Amendments may be adopted by five affirmative votes of the Board of Governors, and shall become effective unless disapproved by the member associations within 30 days from the date of the submission of the proposed amendment or amendments to the presidents of the member associations.

ARTICLE XI

Roberts' Rules of Order, Revised, shall be the standard of authority for the conduct of all meetings of the Board of Governors.

Innerkip Lime Plant to Resume Under New Owner

★ Charles Downing, founder of the noted lime quarries in Beachville. Ont., Canada, has purchased the long idle lime plant at Innerkip, north of Woodstock, Ont., and is equipping it for production. The lime from the Innerkip quarries is claimed to produce a wall plaster of exceptional hardness.

Illinois Approves 150 Miles of Market Roads

Approval of $850,000 worth of projects in Williamson County, Ill., including a system of 150 miles of farm-to-market roads, has been announced by the Works Progress Administration. It was one of 196 projects recommended by the Chicago WPA office and sent to Washington for final approval. The 196 projects ask for a federal grant of $13,985,702 and, with funds contributed by sponsors, will call for a total expenditure of $2,026,365, employing approximately 19,500 men and women.

The approved program includes the following important project:

Farm-to-market roads, Marion County, Federal funds, $760,267.81, sponsors' funds, $50,058.50.

The farm-to-market road project provides for a county-wide system of highways to be surfaced with crushed rock to be prepared in five rock-crushing plants, these plants to be set up at quarry sites where native rock is available.

Jasper Stone Co. Opens Quarry Near Wabasha

★ The Jasper Stone Co., which has been quarrying stone at Weeping Water, Neb., for Missouri River development work, is opening a quarry near Wabasha, Neb., and will soon be making delivery from that point.

Kentucky Contracts for 80 Miles of Roads

Contracts for the construction or improvement of approximately 80 mi. of highways in 15 counties, at an estimated cost of $500,000, have been awarded by the State Highway Commission of Kentucky.

Drier is Installed in Michigan Gravel Plant

★ Koenig Coal & Supply Co., of Detroit, Mich., has purchased a Hetherington & Berner oil-fired drier for its Oxford, Mich., plant.

U. S. Manufacturers Ban France's Cement

PROTEST DEALS IN NEW YORK

Foreign importations of cement for use on PWA projects, were protested against by American cement manufacturers during the month. Specific objection was entered against the use of French cement on New York City public schools which are being constructed with PWA funds. It was declared that these importations deprived American workmen of employment.

The action of the domestic cement manufacturers followed that of the steel men who objected to the use of German steel on the new Triborough bridge in New York. Secretary Ickes has promised that an investigation of the New York situation will be made.

The new regulations adopted by the Public Works Administration, covering the use of foreign materials in PWA projects, might not prevent the use of the French, Danish and other foreign cement in New York City schools, the American cement manufacturers said. They urged a definite ban on the use of foreign materials in the twenty-five New York schools.

Nebraska Firm Improves Its Plant at Louisville

★ The Louisville, Neb., plant of the Ash Grove Lime & Portland Cement Co. has been improved by the addition of a Babcock & Wilcox coal pulverizer.

Plant Closes, 18-Year Limestone Supply Gone

As a result of the exhaustion of existing available limestone the Oregon Portland Cement Co. quarry at Glengary, Ore., is to be abandoned, and conditions are unfavorable for locating and developing new deposits. The quarry was opened 18 years ago and resulted in an expenditure of approximately $100,000, employing from 25 to 50 men and working at full capacity until about three years ago. The company is removing its mine railway, electric locomotives, compressors, drills, etc., and will distribute the equipment to other properties. J. B. Bywater, superintendent, will be transferred to Dallas, Ore.

Florentine Stone Being Quarried in California

★ Florentine stone, claimed to be a volcanic deposit of exceptional value for decorating interiors and exteriors of buildings, is being quarried on Monticello Way, east of Napa, Cal., by the Napa Decorative Rock Quarries Co., Ltd., which has just been granted articles of incorporation. The formation of the new company, which has $20,000 in capital stock, directly followed suspension of operation of the Light Weight Aggregate Co. A 25-yr. lease has been taken on about 300 acres of land, and six workmen are engaged in the construction of buildings and equipment.

U. S. Gypsum Co. Builds Warehouse at St. Paul

★ The United States Gypsum Co., St. Paul, Minn., is erecting a warehouse to cost about $20,000, according to T. H. Kashuba, superintendent.

Consumption of Cement Fuel in Sept. and Oct.

As summarized from the reports of the cement producers supplemented by a few estimates, the following quantities of fuel were consumed at the Portland cement plants in the United States in the month of October, 1935, as compared with the production of 6,960,000 barrels of clinker (unground cement) and 7,510,000 barrels of finished cement during the month: Coal, 335,372 short tons; oil, 453,383 bbls. (or 19,042,086 gals.); and natural gas, 2,087,669,843 cubic feet. The producers also reported 309,144 short tons of coal in stock at the mills at the end of October, 1935.

Corresponding figures from the producers' reports for September, 1935, are as follows: Clinker produced, 6,693,000 barrels, finished cement produced, 7,173,000 barrels; fuels consumed—coal, 314,990 short tons; oil, 102,609 bbls. (or 4,309,578 gals.), and natural gas, 2,171,764,037 cubic feet. The producers also reported 366,859 short tons of coal in stock at the mills at the end of September, 1935.

Installs New Grinding Units in Lime Plants

★ The United States Gypsum Co. has installed additional grinding units at its lime plants at Farnams, Mass., and Genoa, O.

Florida Concern Finishes Year Without Accident

The Florida Portland Cement Co., Tampa, Fla., has completed a 12-mo. period without a single accident and officials are hoping to end the calendar year with a clean record so as to be eligible for the re-dedication of an award received last year for a perfect score in 1933. There was one accident at the plant in Sept., 1934, but there has been none since.

★ The Cullingham - Weinhagen Co. of St. Paul, Minn., has purchased a totally-enclosed 3-ft. by 6-ft. four-deck Plato vibrating screen, manufactured by the Deister Machine Co., Fort Wayne, Ind., for use in a hot asphalt plant.

★ The Archie Stamm Co., gravel producer of Mantua, O., has installed a Fairbanks scale for weighing out loaded motor trucks.

All-Concrete House Started in New Orleans

TO BE MOST MODERN RESIDENCE

Construction of an all-concrete house, designed to adapt the latest developments in modern residence construction to local climatic and living conditions, has been started at New Orleans, La., by the Lone Star Cement Corp. The walls and ceilings are of concrete, rendering the house entirely fireproof. A concrete fireplace in the living room connects with a flue cast of solid concrete, avoiding danger of fires through defective flues. The house will be rotproof because there is nothing in it to rot, and termite-proof, there being nothing for termites to feed on. There is protection against plaster cracks, since all floors are of reinforced concrete and will not sag, and specially designed wall construction, which provides continuous insulation.

H. A. Sawyer, vice-president of the cement firm, stated that its purpose in building this house is to show how well concrete is suited to the construction of an attractive home of moderate cost.

To Spend $500,000 on National Gypsum Plants

★ The National Gypsum Co., Buffalo, N. Y., plans to spend $400,000 to $500,000 in enlarging the plants of the Universal Gypsum & Lime Co., according to Melvin H. Baker, president. The Universal Company was merged with National Gypsum Co. recently. The Pittsburgh-Des Moines Steel Co. has been given a contract for erecting a 1,500-ton ground-lime storage him at the Luckey, O., plant.

Improvements are also planned to plants in the following locations to each cost about $35,000: National City, Mich; Akron, N. Y.; Clarence Center, N. Y.; York, Pa.; Rotan, Tex.; and Fort Dodge, Ia.

New Owner to Operate Iowa City Gravel Plant

G. W. Schmidt has purchased the sand and gravel plant in Iowa City, Ia., which was formerly operated by the Schmidt & Pitnam Sand & Gravel Co.

Novia Scotia Producer Making Plant Addition

★ The Wallace Stone Quarries, Truro, N. S., has commenced the erection of an addition to its plant there. Extra crews were recently added.

★ Homer Johnson of Portland, Ore., and R. O. Dail of Aberdeen, Wash., have installed a new 2436 all-steel Pioneer crusher. It is one of the largest crushers made by this company.

U. S. Projects Create Demand for Portables

OPERATED BY PRODUCERS

The building of power and irrigation projects in Nebraska has brought on a demand for portable sand-and-gravel plants. Among such plants located in the North Platte and Ogallala districts are those of the Abel Construction Co. and D. H. Merritt & Sons, both of Lincoln, the latter company having placed in operation a 6-in. Amoco pump. The Lyman-Richey Sand & Gravel Co. of Omaha is supplying a project on the Platte River, where sand and gravel can be found without much prospecting.

Michigan County Stone Plant Is Now Operating

The Iosco County (Mich.) new stone-crushing and screening plant is ready for operation. It is located 2 miles northeast of Whittemore on the bank of the AuGres River, Mich. Fifteen to 25 men will be required for its operation. The capacity is 600 cu.yd. per day, which will be used for constructing and repairing roads. The plant is operated by electricity and requires two motors totaling 95 horsepower.

Cardiff Gypsum Co. Plant Reopens After 18 Months

After being idle for 18 months the Cardiff Gypsum Company's mill southeast of Fort Dodge, Ia., has resumed operations. The mill has been reconditioned and machinery and equipment in the mill and mine overhauled by a force of 30 men employed for the last two months. The first car-load of plaster has been shipped east and officers of the company say that they have orders on hand to keep the plant busy for months.

Missouri Cement Improves St. Louis Crushing Plant

★ A Northern Blower Co. dust-collector was recently installed in the crushing department of the Missouri Portland Cement Co., Prospect Hill, Mo.

California Firm Expands Lime Plant Operations

Forty men have recently been added to the pay-roll of the California Portland Cement Co. at Colton, Cal., this company materially increasing its roster when operations at the lime plant on the north side of Slover mountain were greatly speeded. Three kilns are in operation at the plant, where aqueduct shipping is scheduled to be resumed soon.

An enlarged pay-roll has been carried by the company for more than two years, however, in order to meet the production demands of such large projects as the Boulder Dam and Metropolitan water district aqueduct, as well as lesser projects, chiefly of a public-works nature.

Lone Star Kansas Plant Wins P.C.A. Safety Award

The Bonner Springs, Kan., plant of the Lone Star Cement Company has again been awarded the Portland Cement Assn. safety trophy for a record of no accidents during the past year. This company has a record of three years without an accident, which lacked only three days of being a four-year one, starting on Aug. 24, 1931, and ending Aug. 22, 1935.

Portable Plant Set Up for Operation in 6 Hr.

A portable plant for crushing gravel, capable of being moved and set up for use in 6 hr., and costing $16,355, has been received by the County Road Commission, Bessemer, Mich. The old plant took a week to set up at a cost of $700. The crushing cost will be reduced from 45 to 50 c. a cu.yd. to 25 to 30 c.

Iowa Producer Builds Railway Ballast Plant

★ The Concrete Materials Corp., Eddyville, Ia., recently built a new plant for furnishing railway ballast. It began operation this summer.

P.C.A. Among Sponsors of Model Concrete Home

One of the outstanding features of Nashville's first model New American Home, one of whose sponsors is the Portland Cement Assn., is the low-cost, precast-concrete floor system which, coupled with the concrete masonry walls, assures an absolutely fireproof house. The floors are precast at the factory and are the result of years of research by the Portland Cement Assn. and allied concrete-products manufacturers.

★ Edward Snyder of Drums, Pa., has opened a cement block factory at Hazelton, Pa. Equipment for the manufacture of the blocks has been installed and production is now under way.

The new sand-and-gravel distributing plant at Selma, Cal., which has been built by the Grant-Service Rock Co. of Fresno, Cal. A 300-ton bin, a ½-cu.yd. General crane and a 400-ft. spur track have been installed and a 30-ton track scale is contemplated.

Trade Body Clarifies Fair Practice Rules

UNFAIR PRACTICES DEFINED

A statement has been issued by the Federal Trade Commission in explanation of Group I and Group II rules which may be incorporated in trade-practice conference rules or agreements approved by the commission.

The unfair trade practices which are embraced in Group I rules are considered to be unfair methods of competition within the decisions of the Federal Trade Commission and the courts, and appropriate proceedings in the public interest will be taken by the Commission to prevent the use of such unlawful practices in or directly affecting interstate commerce.

The trade practices embraced in Group II rules do not, *per se*, constitute violations of law. They are considered by the industry either to be unethical, uneconomical or otherwise objectionable; or to be conducive to sound business methods which the industry desires to encourage and promote. Such rules, when they conform to the above specifications and are not violative of law, will be received by the Commission, but the observance of said rules must depend upon and be accomplished through the coöperation of the members of the industry concerned, exercised in accordance with existing law. Where, however, such practices are used in such manner as to become unfair methods of competition in commerce or a violation of any law over which the Commission has jurisdiction, appropriate proceedings will be instituted by the Commission as in the case of violation of Group I rules.

Eastern Gravel Producer Adds Plant Equipment

★ Thomas and Meuhlhof who operate a gravel plant near Berwick, Pa., have added a steel bin to the equipment and installed a Reliance crusher.

Burbank to Produce Own Paving Material

A permit has been issued in the name of the City of Burbank, Cal., for a rock-crushing plant to be erected on the city's property in the extreme northwest part of the city, to cost $4,000, and to produce material to be used on the streets of the city.

★ A 1½-cu.yd. bucket made by Owen has been installed by the Muskingum River Gravel Co., of Zanesville, O.

★ Two new ⅝-yd. Champion excavators have been bought by the Keener Sand & Clay Co., Columbus, O.

★ The Dixie Fuel & Supply Co., Detroit, has added a 1-cu.yd. Owen bucket to its equipment.

Editorials

The Prevention of Depressions

WE HAVE never thought it fair to condemn the critic of any thought or movement simply because he was unable to offer a practicable substitute for it. For that reason we have never publicly asked those, who are opposed to the measures which the Federal government has adopted in recent years in an attempt to relieve the nation from the burden of an economic catastrophe, to tell in detail what they would do if they were given the opportunity to "save the country." It is our belief that the methods that are under fire are on trial and not the critics of them.

Nevertheless, we would have been among the first to applaud had any of the most important critics offered even so little as a hint of what they thought might hasten recovery beyond their pet remedy of "hands off!" The man who utters that cry is usually the man who has no suggestion to offer, who has never given the problem serious consideration, who has never so much as acknowledged that the problem really concerned him. We would have been glad to hear the proposals of those who insist that current methods are the wrong ones; it would have been a rare opportunity to examine the plans which the critics, who pride themselves on their keen analytical powers, might tender as solutions of the troubles that have beset us. It is not necessary to remind thoughtful students of the times and human nature that the substitute plans, if they ever existed, have yet to be publicly announced. The common attitude has been to retreat from the duty of facing the problem and to rely on the critic's privilege of disclaiming all responsibility for initiating reforms.

To the unthinking type of mind those who hide behind the screen of *laissez faire* seem to have the weight of historical evidence on their side. Have not we always emerged safely from previous depressions?, they ask, and, that being the case, can not we do so again? Has not the capitalistic system sufficient inherent vitality to resurrect itself from the doldrums? Does not a depression alter the economic situation to such an extent that business will revive automatically and inevitably?

The answers to these questions may be stated briefly. While it is true that we have recovered from every previous depression—and without, let it be said, the programs of reform and recovery initiated by the present Federal government—our attitude of letting things alone has not prevented our falling into succeeding depressions. The fact that every previous depression has had a successor has resulted in the adoption of a false belief in the inevitability of depressions, a spirit of defeatism that is conducive to the repetition of the very thing which it fears most. This is not a policy of reason, but one of desperation. By believing that depressions can not be avoided we make ourselves impotent to relieve, cure or prevent them.

As for the fundamental vitality of the capitalistic system, we see no reason why there should be any doubt of that. We have never doubted it nor do we see any justification for losing faith in its good qualities now. But vitality must be directed and controlled, if it is to accomplish the most of which it is capable. A capitalism that can bring no more to bear on its problems than a dispersed and uncoördinated vitality will not be equal to the task of attaining ends that require leadership and concerted effort. As we have said before, we believe that capitalism has all the latent energy, genius and capacity needed to solve the economic problems that confront us, but in the absence of direction and unification they can effect nothing in themselves and must continue to be restricted by the conditioning factors that surround them. Here, again, the belief in inevitability and the dependence on a policy of "hands off" will not only fail to relieve a tense economic situation but may actually prolong it.

Every depression alters to some extent the economic situation but only in so far as every event (acting as a cause), affects every event (seen as an effect) that follows it. It does not, however, disturb the underlying causes of industrial depressions, nor does it provide any guarantee that other depressions will not follow. The theory that business will revive automatically and inevitably may be a pleasant-tasting sedative, but it is a wholly unsatisfactory medicine on which to rely if we expect to effect a cure. The problem facing modern civilization is not only to find the means for ending depressions but also the means for preventing depressions. *Laissez faire* may accomplish the first but it does not disclose or provide the second. It may allow recovery—certainly it will not hasten it—but it only makes a recurrence easier. It may qualify as a restorative, but it has no merit as a cure.

The recovery of business which we have observed in the last year and a half has been due to many things. Those who approve the government's efforts to effect that recovery attribute it solely to those efforts. Those who condemn those efforts say that recovery has come in spite of them. Since both statements are assertions unsusceptible of proof, neither is worth much serious consideration, but of the second one may say that it is a rather sickly example of intellectual activity and quite unworthy of those who offer it with the implication that they have a much better scheme in mind. It is easy to say that recovery would have come without government assistance, just as an unbeliever in the efficacy of scientific medicine might say that the patient would have recovered without treatment. The neglected patient often dies, and it is just as possible that the depression might have continued much longer if the government's much-needed

stimulant had not been provided. The direct results of the government's program can be measured, its indirect effects can not; one we know definitely, the other we can only estimate. One point can not be denied and that is that recovery did not come until after the remedial measures had become effective, and that three years of *laissez-faire* inactivity had failed—as any sensible observer must have seen that it would fail—not only to stop, but even to check, the increasing decline of business.

We must be more tolerant of the theory that economic conditions can be controlled and we must make ourselves ready to accept the principle that business depressions can be prevented as well as cured. Until we reach that state of open-mindedness we must reconcile ourselves to the "inevitability" of depressions and all the suffering and terror that accompany them.

A Fallacious Work-Relief Policy

NO one has ever accused us of being unsympathetic toward intelligent plans for the reduction of unemployment or sensible methods designed to make employment less insecure. We have always recognized the fact that without regular employment at remunerative wages the bulk of our population—those on whom industry depends for a sustained demand for its products—can not purchase the necessities, to say nothing of the comforts, of life. Without certainty of income in amounts exceeding the bare subsistence level there can be no continuous support of industry, no adequate return on invested capital. But when we see the desire to provide work carried to the ridiculous extremes illustrated by the specification requirements of the proposed lock near Peoria on the Illinois River, we must voice grave doubts of the wisdom of creating employment in this manner.

In addition to the provision that requires the contractor to use relief labor in his own construction operations is the one that forces him to use raw materials produced by the same labor. Thus, the effects of a make-work program as a solution of the unemployment problem are extended from the field of construction, where its use may sometimes be defensible, into that of raw-material production, where its use is, in our opinion, indefensible. No owner of a costly sand-and-gravel or crushed-stone plant should be forced to try to compete with the product of relief labor working on the nearest available sources of supply. Neither should he be asked—as an interpretation of the requirements has seemed to indicate that he may—to entrust all his operations to inexperienced relief labor, even though some of his processes may justify the employment of unskilled hands. No established industry can hope to support itself, or to recover from the economic restrictions that have engulfed it in recent years, under a system that injects into its mechanical production processes raw labor recruits, whose sole claim to consideration is the presence of their names on public relief rolls.

We have often declared ourselves in favor of work rather than idleness for those on relief, for we have been fearful of creating in this country a class that would come to look upon a government-provided income-without-work as a natural right. Such a state of mind would, we believe, be fatal not alone to American ideals of service and reward but also to the very foundations of a well-balanced society. But we confess that we would prefer idleness rather than work for those on relief rolls if, in order to provide employment, the regular processes of industry would be upset and the chances for reasonably profitable operation lessened merely to reduce the sloth-encouraging disadvantages of the dole. We believe that those charged with the responsibility of providing employment for those on relief go far beyond the realm of good sense and sound economics, when they demand the employment of relief labor in the production of basic raw materials. The natural tendency to extend the labor provisions of this project's specifications to other public works must be watched carefully, lest the material-producing industries become thoroughly disorganized at the very moment when their recovery seems at last to be assured.

Thrift in Industry

OBSOLESCENCE is one of the most formidable factors with which modern business must deal. It has brought many millions of dollars' worth of once efficient machinery near the scrap-heap and it has sharpened the teeth of modernized competition. The kind of thrift that built vast surpluses and continues to cling to them in the face of better equipped competition is being converted from an asset into a liability. Thrift is not at all times and under all conditions a wise practice. Under the pressure of competition imbued with the modern spirit of progress it may prove to be a fallacy.

Thrift is being attacked by the forces of government in the form of tax legislation. Large surpluses that have not been distributed in the form of dividends to stockholders may for that reason become subject to taxation, so that failure to improve existing but obsolete plant facilities may become a legal as well as an industrial wrong. The fact that many obsolete plants, whose costs have been written off, continue in operation is construed by the Treasury Department as evidence that they were too rapidly depreciated, and the government now threatens to disallow depreciation schedules and to levy a tax equal to 13¾ per cent. of the amount of depreciation disallowed.

These threats are having the effect of awakening industrialists to the folly of continuing to save when a policy of wise spending for modernization is dictated by good sense. The fear of forward-looking competition and the pressure of government taxation should bring surplus-hoarding business to a realization of present-day needs.

Organized Safety Work to Be Objective Throughout Cement Industry

Model Committee Set-up and How To Run It, Outlined for Plants

BANISHMENT of occupational injuries in cement plants of the country is the objective of a campaign inaugurated by the Portland Cement Association, with the issuance of a complete committee organization set-up, and definite instructions on how to run such a committee. The Association takes the position that because safety is essentially an operating problem, it requires the training and coöperation of every man in the plant.

As many employees as possible must have an active part in the work of promoting safety, it is declared. The justification for a committee set-up, as outlined by the association, is as follows:

(1) The foreman is the key man. He needs continuous training in his obligations and responsibilities. His attitude must be based on something more substantial than the belief that safety is a good thing. He must know, as a practical operating man, how to recognize a hazard, how to plan a job for safety, how to train and lead his men and, finally, how to analyze and determine accident causes. Weakly attendance at short safety meetings where there are no speeches and where he is expected to come to a conclusion about the cause and prevention of accidents occurring in the plant will teach him that safety is a problem that "wishful thinking" and luck will not solve.

(2) Rank-and-file employees should be represented on the safety committee for two good reasons. First, to provide a means of expression for the man on the job, and secondly, as a means of direct training in safety. Committee service develops a sense of personal responsibility and will often reveal traits of intelligence and leadership which will put a man in line for promotion. Rotating service spreads the opportunity for safety training.

(3) An organization of sub-committees will do much to insure a well-planned and properly executed safety program. A problem once assigned to a sub-committee will be guaranteed attention and it is not likely to be overlooked in the general work of the main committee. Here also, there is an opportunity for maximum participation and training.

It is important that chairman of sub-committees be chosen with care. These committees should only exist as long as they perform a useful service. A monthly report is a monthly check on the need for the various committees.

This suggested model safety organization for cement plants does not claim to be superior to all others. Effectiveness is the only true test and many fine records have been made in plants where the safety work is conducted in a manner which has little resemblance to this plan. However, many plants in the cement industry have had consistently poor records, many times worse than the average. Others have slipped badly and their methods seem to have lost effectiveness. A fresh start is needed and the plan outlined here merits a trial. Slight changes and adaptations may be necessary but the vital need is for action.

The first essential for success is a determination on the part of management to prevent accidents. Without this determination no plan will succeed.

MODEL SAFETY COMMITTEE AND FUNCTIONS

Structure

I. *Chairman.*—Chosen by appointment of plant superintendent to serve not less than 6 months, not longer than 12 months.

II. *Secretary.*—
- A. Chosen by appointment of plant superintendent for permanent service.
- B. Suggested suitable appointees: safety engineer or supervisor, chief clerk, assistant superintendent.

III. *Membership*—
- A. Permanent committee members: (1) Departmental foremen, (2) mill foreman, (3) quarry superintendent or foreman, (4) chief electrician, (5) master mechanic, (6) superintendent and assistant superintendent.
- B. Rotating members to serve from 3 to 6 months: (1) Six to twelve employes representing different departments, (2) Nominated by foreman and elected by permanent members.

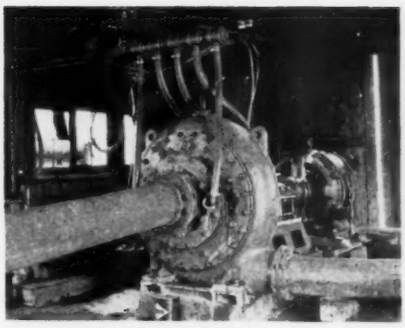
IV. *Standing Sub-Committees.*—
- A. Structure: (1) Chairman (appointed by general chairman from permanent committeemen), (2) Membership as activities dictate. (Three is ideal working unit. Not more than five), (3) Personnel (except chairman to be chosen from non-members of general committee for rotating service, 3 to 6 months).
- B. Function: (a) Programs and events, (b) Guarding machinery, (c) Safety rules, (d) Accident investigation, (e) Inside housekeeping, (f) Outside housekeeping, (g) First aid, (h) Fire prevention, (i) Employee welfare, (j) Plant safety publicity.

Meetings and Activities

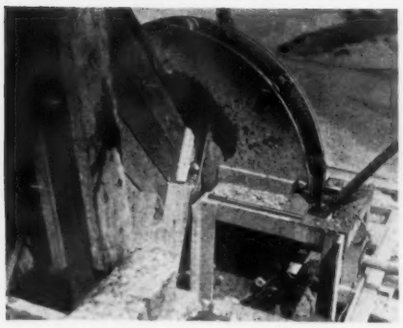
I. *General Safety Committee.*—
- A. Weekly meetings at same time each week. Start on time. (1) Presiding—rotate by appointment of chairman. (2) Program: (a) Attendance record made by secretary. (b) Introduction of new employees. (c) Report by chairman or secretary: Accidents or near accidents of week previous including: person or persons involved, location, foreman in charge, circumstances, recommendations. (d) Explanation by foreman involved and report of action taken by him. (e) Discussion and recommendations. (f) Disposal of accident reports by: (1) Reference to sub-committee, (2) Recommendation for specific action, (3) Acceptance as is. (g) Adjournment. Announce next chairman.
- B. Monthly Meeting.

(1) Presiding—general chairman. (2) Program.—(a) Roll call, (b) Unfinished business, (c) Reports of sub-committees, (d) Discussion and formal action on sub-committee reports, (e) Review of month's safety record, (f) Review of month's activities, (g) Consideration of PCA

(*Continued on page 28*)



The dredge pump with its motor in background.



The soft-stone eliminator that has displaced six men.

Belt-conveyor discharging over grizzly to soft-stone eliminator.

Gravel-Dredging Firm Revises Methods and Reduces Production Cost

Soft-Stone Eliminator Displaces a Picking Belt and Labor of Six Men

By W. E. TRAUFFER

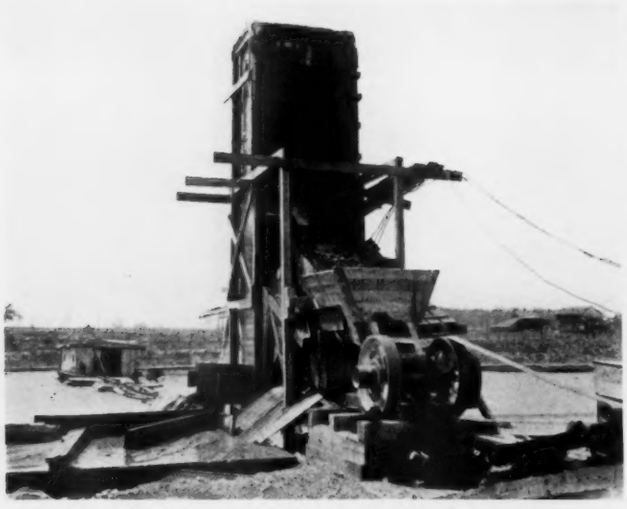
THAT economies in operation of a small plant can be attained through an intelligent improvement program has been demonstrated by the Shenk Bros. Gravel Co. of Durand, Mich., of which Donald Shenk is owner. This company's plant, located 4 mi. north of Durand, was built in the spring of 1930. An 8-in. dredge pump was used at that time and the material was piped to the top of the plant. In 1932 this method became uneconomical, as dredging operations were moved farther from the plant. This problem was solved by the installation of a belt-conveyor to carry the material from the edge of the dredge pond to the plant. A soft-stone eliminator was then added to improve the product. This eliminated a picking belt and 6 men. Early in May, 1935, the latest improvements, consisting of the installation of the latest improved type of dredge pump and a vibrating screen for rewashing the materials before loading, were made.

The deposit consists of 30 acres, the material ranging from 12 to 35 ft. in depth. About 45 per cent. of this is sand. Clay overburden averaging 5 ft. in depth is removed by a ¾-cu.yd. Bay City gasoline shovel and is hauled away in trucks.

The dredge is of the standard type with a timber hull and superstructure. An A-frame supports the 33-ft. intake pipe. The dredge pump is the latest type Amsco Type M all-manganese unit with a 10-in. suction and an 8-in. discharge. A stone box ahead of the pump is fitted with a valve to let out air. A 4-in. pump is used for priming. The dredge pump is driven direct by a 150-hp. Westinghouse motor at 480 r.p.m. The intake line is operated from the A-frame by a Novo hoist driven by a 2½-hp. electric motor. Goodrich suction hose and dredge-line connections are used.

Crane with ¾-cu.yd. bucket loading sand from stock-pile into truck for shipment.

One of the company's trucks stock-piling sized material. Main part of plant at right.



The scalping screen and crusher at shore end of dredge line. Sand sump at left. Dredge in background.

Gravel being washed as it passes over screen preparatory to being loaded into waiting truck.

This pump is handling 60 cu.yd. per hour, a distance of 250 ft. against a 20-ft. vertical head. The dredge-line discharges into a steel and rubber-lined box where water, silt and some of the sand are allowed to overflow into a concrete settling tank. Water and silt overflow into the dredge pond and a crane handles the sand from this tank to stock-piles or trucks.

The coarser material is fed to a Simplicity 3-ft. by 6-ft. double-deck vibrating screen having 1½-in. and ⅛-in. cloth. The oversize goes to an Acme 10-in. by 18-in. jaw crusher and the sand to the above-mentioned sump. The crusher product and the material retained on the lower deck of the screen are discharged on a 24-in. belt-conveyor which operates on 240-ft. centers and carries this material to the top of the plant. This is a Link-Belt conveyor with Goodrich belting.

The material is discharged over a grizzly having bars spaced ½-in. apart. The oversize is discharged into the Knickerbocker soft-stone eliminator which, according to Mr. Shenk, reduces the soft stone with very little breakage of the good material. The average of 4 per cent. of soft stone in the deposit is reduced to about 1 per cent., well within all specifications.

The product of the eliminator and the "throughs" from the grizzly are combined and discharged to a Simplicity 3-ft. by 6-ft. triple-deck vibrating screen. This has ⅞-in., ⅜-in. and $^{3}/_{16}$-in. cloth. The three sizes produced go direct to three bins, each of which has a capacity of 35 cu.yd. Trucks can be loaded through chutes. Aggregates for concrete can be discharged on a portable belt-conveyor which feeds a Simplicity 3-ft. by 6-ft. single-deck screen for rewashing. Trucks are loaded from this screen.

The jaw crusher and eliminator are belt-driven by individual 20-hp. motors. Wash water for the plant is furnished by a 5-in. LaBour pump also driven by a 20-hp. motor.

The company owns three International 1½- to 2-ton trucks, two of which are equipped with Goodyear and one with Kelly-Springfield tires. These trucks make deliveries as far as 20 mi. from the plant, the average haul being from 12 to 15 mi. They are also used for stock-piling materials by backing them up a ramp laid on the pile. Aggregates are loaded out from storage by the ¾-cu.yd. Bay City gasoline crane which handles sand from the sump.

Organized Safety (from page 26)

Monthly Bulletin and recommendations to prevent similar accidents, (h) Discussion by plant superintendent or assistant superintendent of committee recommendations referred to them and action taken. (i) Discussion of program or special activities for coming month.

II. *Sub-Committees.*

A. Meetings—At least monthly. Chairman will prepare report for general committee.

B. Activities. (1) Programs and events: to recommend programs, speakers and entertainment for safety mass meetings. To supervise details and handling. (2) Guarding machinery: the master mechanic is logical chairman. To act on recommendations for guarding equipment. Maintenance of guards. (3) Safety rules: constantly to review rules to keep them up-to-date. To recommend new rules when necessary and based on experience. To recommend methods of publicizing rules. (4) Accident investigation: to render complete reports on accidents, their causes, direct and contributing. To act independently of any other investigation. To act immediately when an accident or near accident occurs. (5) Inside housekeeping: to report on housekeeping conditions under the mill roofs. To inspect at least weekly. (6) Outside housekeeping: same as 5. All outside property. (7) First Aid: To recommend training in first aid practices. To act in emergencies. 8. Fire prevention: to report on fire hazards and make recommendations for fire prevention. To inspect fire extinguishers regularly. (9) Employee welfare: to keep in touch with sick and injured fellow employes and assist wherever possible. (10) Publicity: to furnish interesting personal items and safety material for bulletin boards, employe publications, etc. To furnish pictures and reports of interesting events for use in Accident Prevention Magazine of PCA. (11) (Other sub-committees as required by conditions.)

Winning A Safety Trophy From P.C.A.

Types of posters used in safety campaign at Buffington Atlas plant.

By F. H. SASS

Supervisor Safety and Labor, Universal Atlas Cement Co. at Buffington, Ind.

PROBABLY there is no greater incentive in the world than the desire "to show them I can do it." History's pages are sprinkled with countless illustrations of battles won, inventions and discoveries made and progress accomplished because some stubborn man decided to show scoffers he could do the thing they said couldn't be done. In the world of sports it accounts for many of the spectacular upsets when the underdog suddenly triumphs over the highly-touted favorite. Even in the Bible we find a shepherd boy with a sling-shot determined to prove that a giant could be brought down, and David conquered Goliath.

That is the position we at the Buffington plant of the Universal Atlas Cement Co. were in, when some years ago we first began to talk about winning the Portland Cement Assn. trophy for a perfect no-accident year. Eyebrows were gently lifted in expressions of doubt, when we announced that we were going after the trophy. We were underdogs in the battle against those twin devils—carelessness and indifference. And the very fact that some people scoffed made us more than ever determined to succeed.

People who doubted our ability to accomplish our aim felt that everything humanly possible had been done to cut down the accident record in our industry. They knew that for years it had been a policy of the United States Steel Corp., of which we are a subsidiary, to place adequate safety equipment on all machinery. They knew that this safety policy had been inaugurated under the late Judge Gary years ago and that it had accomplished a great reduction of accidents.

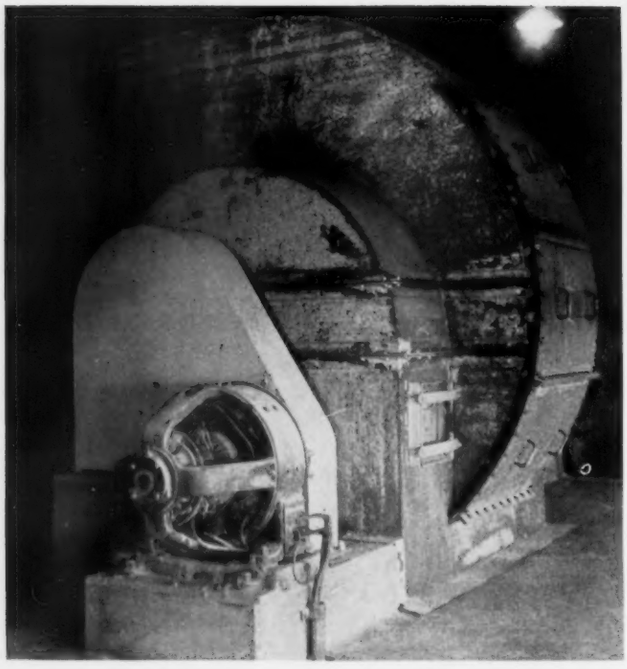
But they also felt that mechanical safeguards alone could not do the job. They knew that in a plant the size of ours a moment of negligence by one individual could undo the record achieved by all other members of the organization. They doubted our ability to prevent that single moment of negligence throughout an entire year. In the vernacular of the football coach, they did not believe that we could keep the team keyed up throughout the entire season.

That made us determined to come through, and in 1932 we were mighty proud that we had reduced our time-lost cases to only two. The next year, we decided, would do the trick. But the one moment occurred in February, and a sprained ankle put us out of the running for that year. We redoubled our efforts then and 1933 passed without further mishap.

Having kept our record intact for ten months in 1933, we started in December to lay plans for 1934. The chairman of the general safety committee called a meeting of the different committees to map out a campaign for the coming year. Since nothing succeeds like success, it was decided to retain all those accident-prevention activities which had proved so successful during 1933, for the time being at least. These had included full assumption of responsibility by the supervisory force and a daily contacting by them of their men on each turn; committee and departmental meetings; committee inspections; and a general safety rally conducted by the men themselves each month.

WE knew that we had set ourselves a hard goal to reach and that it would be necessary for every member of the organization to take a part if we were to be successful. To keep interest at high pitch we realized that new ideas must be injected from time to time into our campaign. The general safety committee felt that through an extensive and varied advertising campaign, in addition to the regular activities, it would be possible to reach every member of the organization and keep him interested.

That led to making mimeographed copies of the minutes of the general safety committee which were furnished to all members of the supervisory force.



How waste-heat boiler fan covering makes for safety at Buffington Universal Atlas plant.

They, in turn, took up with their men the subjects covered and went over them in detail.

Two months went by safely under this set-up. But we had to continue to inject new ideas into the campaign. Our next step was the inauguration of a plant paper which, on the first of March, 1934, was mimeographed and distributed to all members of our plant organization. It made its bow in a modest way. One 8½-in. by 14-in. sheet comprised the first edition. It carried a cartoon, a short editorial regarding our efforts to keep the safety flag flying and a column called "Narrow Squeeks." In this column was a short summary regarding the causes of minor injuries which employes had sustained, and words of caution helpful in avoiding a recurrence of those incidents. "Watch-Ems" was another column calling attention to the importance of wearing goggles, hazards due to mushroom tools and the necessity for cleanliness. There were also items written by some of the force, and a report by the safety inspector of his trips through the mill in which he pointed out practices or conditions that might be the cause of accidents.

The new publication "clicked." It's still coming out regularly, but it has grown in size. Now it has a full-page cartoon which is drawn by one of the men in our plant organization, and it has an official title, *Buffington Safety News*. Each month, in addition to the cartoon and date of issue, the front cover shows in large figures the numbers of days which have elapsed since the last time-lost accident.

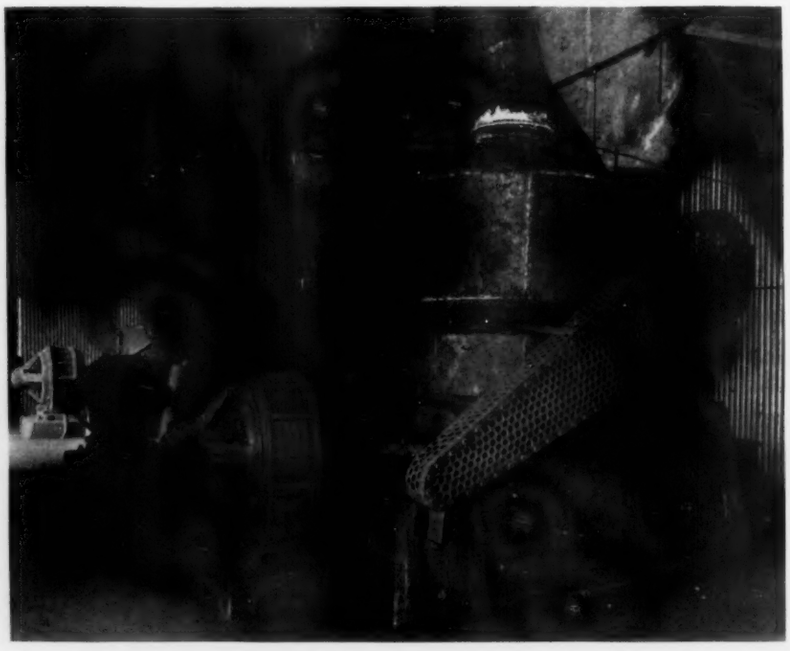
If I may digress from our subject for a moment, I would like to point out the fact that this publication and other safety activities have a valuable by-product in the form of better understanding between men and management. Our paper has grown to be looked upon as more than simply safety propaganda. It is read eagerly, because it contains news and personal items about individuals. It is crammed with names because names make news and make interested readers. Although its main purpose is still to promote safety, it does an industrial-relations job that can not be overlooked.

The publication was supplemented from time to time with special notices which it was felt would stimulate our campaign to win the trophy. Nothing that might help us come through was passed up, if we thought it would help the cause.

In our October general safety committee meeting a suggestion was made that we have made up a sign, which a man could carry around the plant for a couple of hours each day. The suggester said that no doubt we had seen signs carried by sandwich men and that he thought it would be effective for us. We decided to give it a trial.

A FRAME measuring 30 by 15 by 2 in. and having a handle through the center, that made it easy to carry and hold up, was made. Signs with safety slogans or wording calling particular attention to the condition of tools, protective equipment, health hints and announcements of safety meetings were displayed on both sides of this banner. Later on a couple of bright-colored smocks were made up for the man who carried the sign around—bright because the brighter the color the more conspicuous he became. In putting on this stunt it was impor-

(Continued on page 36)



This is No. 3 coal house. Note how well the machinery is guarded.

Demand for Cement Keeps Plant Running at Capacity for Five Years

Daily Output Is 1,500 Bbl. per Kiln at Fuel Rate of 1,315,000 B.T.U.'s per Bbl.

By A. W. ROBINSON

PICTURE a cement plant located in the outskirts of a city of a quarter of a million people, in approximately the geographical center of a large and prosperous country, where Ford V-eights and Chevrolets are almost as familiar as in the United States; with only one much smaller competitor within 300 mi. in any direction, and too far from seaboard for any competition from abroad; with no winter freezing weather to interrupt construction and make it a "seasonal business"; with no worries over high-early-strength cements and special products to tempt a finicky buyers' market; a plant with absolutely modern equipment in every respect, as measured by the best in the United States; with plenty of cheap labor; both railway and truck transportation; and, finally, such a demand for its product that it has run for five years at maximum capacity, without a shut-down except for repairs, and yet at the end of a 24-day shut-down in May of 1935—for the first general overhauling of equipment since the plant was built, and for the installation of Oliver slurry filters—the 15,000-ton clinker storage was absolutely empty, and the cement silos' contents down to a few hundred tons.

The aërial tramway as it crosses the hill, the canal and the railway on the way to the mill.

This seems like the dream of a cement operator's paradise, but in spite of justifiable doubts as to the actual existence of such a situation anywhere in this day and age, this is really the case with the Juan Minetti plant of the Compania Sudamericana de Cemento Portland, located just outside the city of Cordoba, Argentina.

Argentina is developing very swiftly, and seems to be recovering from the depression at a much quicker rate than is our own country. As yet there are comparatively few concrete roads, but the people are becoming more and more "road-minded," and it is inevitable that in such a progressive country the large cities, and even the small towns, will in the not-too-distant future be connected by a series of highways in a class with our own. There is likewise a much more extensive field there than in the United States for the use of cement in construction of houses and other comparatively small buildings, for lumber is prohibitive in price, and all such buildings are constructed of brick, stone and cement.

The Minetti plant is situated almost in the geographical center of the country, at the edge of the second largest city, Cordoba, and at the foot of the "Cordoba Hills," which have become the "summer playground" of Argentina—in fact the only vacation spot except the seaside, which is available to the great majority of the population. Throughout these hills are summer hotels and houses as fine as

General view of the cement plant at Cordoba, Argentina.

The camp for workers at the Juan Minetti cement plant.

Lower level of quarry. Tunnel at left leads to "air-cable" loading station, that on right to another quarry.

ours in the United States, and they quite naturally demand—and will get—good roads. Furthermore, a large portion of the country surrounding Cordoba is irrigated from lakes in the hills, and the canals carrying water for this purpose require a considerable amount of cement.

The demand for cement has been such that the Minetti plant has been operated at full capacity, without shut-down, from the time of its construction in 1930, till May, 1935, when it was closed for the first time for a general overhauling of equipment and for the installation of Oliver slurry filters, which were purchased with the view to decrease fuel consumption and increase the plant output.

With the market and competition as they are, the problems of this company are quite obviously only those of plant operation—to produce enough good cement at suitable cost, to supply the demands put upon it. While in many respects the plant equipment is quite similar to some in the United States, it is nevertheless interesting to know what our South American friends are doing, and how they are meeting their problems. Labor conditions and wages are entirely different from our own, and man-hours not nearly so important as they are with us. On the other hand, machinery and maintenance supplies are much more expensive than here, and consequently more important; so that South American methods of dealing with given situations are often quite different from our own. Due to this reversal of conditions, an examination of cost data can be of little interest in this country. They have, however, met a peculiar quarry condition in an interesting way, and in only two months of operation with slurry filters have accomplished as good results as any plant in the United States.

The Minetti plant has two kilns and was built by the Polysius Corp. of Dessau, Germany, in 1930. It is quite similar in design and equipment to those the Polysius Corp. has built in the United States. Its generally compact arrangement can be pretty well seen from the photographs. Referring to the general view, the plant buildings from right to left are: Superintendent Hesse's home; fuel-oil tanks; then, on the near side, the kiln room with slurry filters overhead, waste-heat boilers, power-house, and slurry silos; and on the far side and parallel, the 15,000-ton clinker storage, finish mills, raw mills, and crusher-house. Beyond and in line with these are the cement silos and pack-house, then the machine-shop, and the laboratory and plant office at the far end. Store room, bag-repair house and washrooms are behind and parallel to the mill room and clinker storage.

In the foreground may be seen the canal, by which water is brought from the San Roque Lake, some 25 km. away among the hills, for the use of the cement plant, for the irrigation of the surrounding country during the eight dry months from March to October.

All the limestone in the Cordoba district—and there is no better within 300 mi.—is of a hard crystalline structure, heavily streaked with high-magnesia rock unsuitable for cement manufacture. This high-magnesia rock, however, separates quite readily from the good stone on shooting, and at the Minetti plant it is eliminated by careful hand picking of the entire quarry production, when loading the cars. As labor is quite cheap as compared to that in the United States, this operation is not too expensive, and the unique manner in which it is handled is worth description.

The quarry is situated among the hills about a kilometer from the plant. It consists of two pits, one with two levels some 12 m. apart; and the other a single level, beyond another hill through which the rock is hauled to the first through a tunnel.

In the accompanying view of the first pit, the men can be seen carefully hand-picking the rock, loading some of the dump cars with good rock and others with the high-magnesia refuse. The good rock is trammed to the edge and dumped over to the lower level, and the refuse cars are collected and hauled by

Upper level of quarry. Cars are loaded by hand because of high magnesia content of stone.

a "dinky" locomotive to a "hollow" where they are dumped.

The lower level is equipped with cars whose ¾-cu. m. bodies are simply set on the trucks, having studs on the ends by which they are picked up to become the buckets of an aërial tramway, or "air cable" by which the rock is carried to the plant. These cars loaded with good rock, dumped either from the upper level or from the lower face, are trammed to the tunnel, in which is the loading terminal of the Bleichert "air cable." The loaded cars enter the tunnel on one track, the bodies are picked up by the bails of the "air cable," and the empty trucks receive the empty bodies and return to the pit on the other track.

In one of the views tracks can be seen disappearing in the right background. This is the mouth of the inclined tunnel leading to the second quarry pit, from which trains of loaded rock cars are hauled by means of a rope hoist.

The "air cable" is so designed and built that the transfer of buckets is accomplished without delay or difficulty. It carries the rock a hundred yards or more through the tunnel under one hill, thence out and up over another hill, across a canal and over the railway tracks to the crusher-house in the top of the cement plant.

The argillaceous material is a brown, crumbly clay, which makes up 10 to 15 per cent. of the raw material. It is dug by means of a Bucyrus steam

Loaded cars headed for tramway loading station. Car bodies are lifted from trucks and carried by tramway.

shovel, and loaded into the same type ¾-cu. m. cars as those used in the quarry, and these become the buckets of another Bleichert "air cable." This cable carries the clay a matter of some 4½ km. over and around several hills and discharges it directly below the rock in the crusher-house.

With the situation existing at this plant these Bleichert "air cables" both on rock and clay, make an excellent solution of what otherwise would be a very expensive haulage problem. The quarry cars are shifted in the pits, and from pit to refuse dump by Koppel "dinky" locomotives fired with wood. Larger locomotives of the same type are used to shift freight cars for the shipment of cement and for the receipt of fuel oil and other supplies.

Due to the careful hand-picking and sizing of the rock in the quarry, only one set of crushers is required to produce raw mill feed. The "air cable" buckets are dumped alternately into two reciprocating feeders, each of which feeds one Allis-Chalmers No. 18 gyratory crusher.

The raw mills, two in number, are Polysius No. 20 3-compartment mills, each with a capacity of 18 metric tons (108 bbl.) per hr. The slurry is ground at a moisture content of 38 to 40 per cent. and the fineness resulting is 8 per cent. on 4,900 per sq. cm. (about 180-mesh). Clay is fed to the raw mills dry —no driers are required as rainfall is so slight—the feed of both clay and rock being done by a rotating-disk feeder.

There is a battery of 6 concrete slurry silos, each with a capacity of 350 cu. m. (1,375 bbl.), with one final kiln-feed silo of 1,500 cu. m. (5,900 bbl.), all equipped with air agitation but no mechanical agitators. The slurry is pumped by compressed air—Polysius Pressors—to the silos, and from them to the two slurry-feed tanks above the filter floor.

The slurry-filter installation, made in May, 1935, is typical of the best practice in the United States. It consists of two Oliver United Filters, Inc., 12-ft., 6-disk American slurry filters, one over each kiln. The slurry is fed to the filters by a constant-pressure adjustable-orifice feeder, controlled by the kiln burner, the filter operator running his filters at proper speed to use up all the slurry as fed to them. The filter-cake drops from the filters to Link-Belt conveyors and thence to Link-Belt pug-mills, where the flue dust (about 5 per cent. of the raw material) is thoroughly mixed with it. It is then fed to the kilns through Kronstad shell-type kiln feeders.

The dust mixed with the filter cake is collected from beneath the kiln housing and boilers by a system of screw conveyors, carried by a bucket-elevator to two storage bins (one over each kiln), and thence fed uniformly to the pug-mills by screw conveyors.

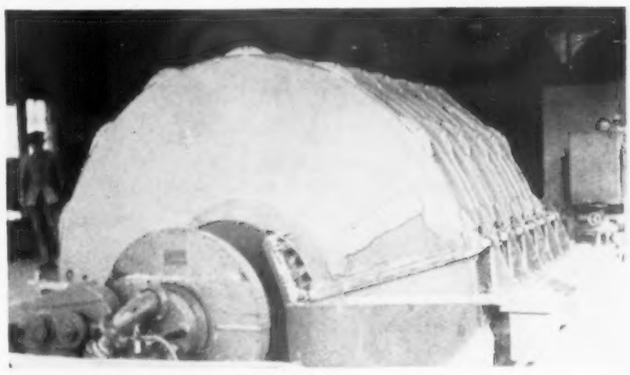
Slurry is fed to the filters with 38 to 39 per cent. moisture. The average filter cake moisture is 18 per cent., and when mixed with the flue dust gives a kiln feed of less than 17 per cent. moisture. The material is almost dry to the touch, and is fed to the kiln in very small pieces which do not "mud up" either in the feeder or in the kiln.

Vacuum for the filters is supplied by three Ingersoll-Rand 24-in. by 11-in. ES-1 vacuum pumps, driven through V-belt drive by General Electric motors.

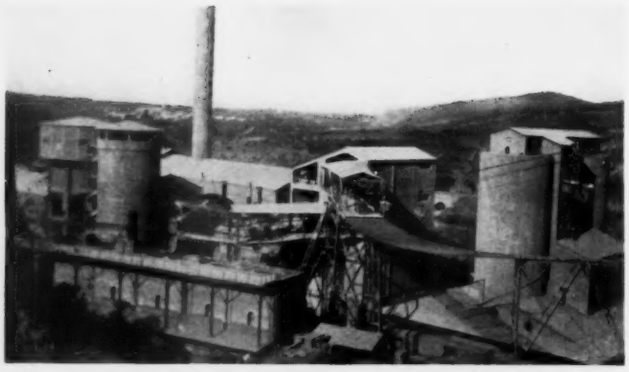
The entire job, including all the equipment, the design and the construction, was handled by General Electric Co., S. A. of Buenos Aires, the Argentine representative of all the equipment manufacturers involved.

It should be of interest, as a gage of Argentine construction work, to note that the first part of the filter equipment reached the plant May 6, and the first kiln completely equipped was started May 30, the start of the second one being delayed till June 6, due to the late arrival of a part of the equipment.

The two kilns are of the Polysius Solo type, 70 m. (230 ft.) in length including the coolers, which are integral with the kiln. The feed-end diameter is 2.7 m. (8.87 ft.) extending for 43 m. (141 ft.). The enlarged burning zone is 3.4 m. (11.1 ft.) in diameter by 15 m. (49.5 ft.) long, and the cooler 12 m.



Part of the installation of slurry filters completed this year.



View of plant showing discharge end of aërial tramway.

(39.5 ft.) long. The pitch of the kilns is 5 per cent., and normal operating kiln speed is 45 revolutions per hour. The kiln lining used is A. P. Green's Cusite.

The kilns are equipped with Siemens CO_2 and CO recorders, draft gages and exit-gas temperature recorders, giving the kiln burner a careful check upon his operation.

The fuel burned is oil, with a heat value of 10,000 calories per kilogram. It is preheated with steam before firing.

The clinker is taken from the coolers by a bucket-conveyor and elevator, and distributed to the 15,000-ton clinker storage by a Link-Belt Peck carrier. It is recovered from storage by belt-conveyor and elevator, and is delivered from the mill-feed bins by disk feeders to two Polysius, 3-compartment, No. 20 finish mills, each with a capacity of 11 tons per hr., with a fineness of 5 per cent. on 4,900 per sq. cm. (180-mesh).

The finished cement is stored in 3 cement silos having a capacity of 3,500 metric tons (21,000 bbl.) each.

The pack-house is equipped with two Bates 4-tube bagging machines, the bags being delivered either to the railway or the truck transportation units. Both cloth and paper bags are used, about half of the product being shipped in each. The bags are of 50-kg. capacity, which amounts to 110 lb. As yet no bulk shipments have been made or desired.

The railroads of Argentina are cursed with two different track gages, some lines having a gage of 37 in., and others a gage of 67 in. Both types come to Cordoba, so the Minetti plant is equipped with both wide- and narrow-gage tracks, the locomotives being wide-gage but with separate couplings to handle either type of cars.

The plant produces all its own power and light, including that of the company-owned houses where the employees live. It is equipped with two Borsig waste-heat boilers, which have auxiliary oil burners for starting and when the kilns are under light load. These burners formerly had to be used quite often to augment the kiln gases, but since the installation of the filters have not been so used.

The power consumption throughout the plant is approximately 65,000 kw. per 24 hr. It is supplied by 2 A.E.G. 2,500-kw. turbine-driven generators. The power produced is 3-phase, 60-cycle, 500-v. alternating current.

As mentioned previously, the installation of slurry filters was made with the objects of reducing the amount of fuel burned and of increasing the plant output. Due to the very excellent installation made, no mechanical nor operating difficulties were encountered with the new equipment, so that all the time and effort could be put upon the problem of burning the new type of load.

It is quite evident that the Solo kiln, or any other with the cooler integral with it, is limited in its production by the cooling capacity of the cooler. Obviously, lowering the fuel rate reduces the amount of air which can be drawn into the kiln, whereas increasing the kiln output increases the work required of this air in the cooler. Consequently, with a cooler designed with no provision for a later increase in kiln capacity, the production of the kilns filled with filters is actually limited by the cooler capacity. These coolers are lined with expensive, high-temperature steel, so it would be disastrous to overload them.

Due, however, to the extremely intelligent manner in which Supt. Hesse and his subordinates went about the matter of learning to handle the new conditions, they were able to accomplish a marked increase in kiln output without adversely affecting the coolers, and, of course, made a decrease in fuel rate in proportion to the amount of water removed from the kiln feed.

Before the installation of the filters the average kiln output was 200 metric tons of clinker per day. It must be borne in mind that the fuel rate available is the total for the plant, which includes all power for the "air cables," as well as for the plant machinery and the lighting of the company houses, and includes not only the fuel burned in the kilns, but likewise a considerable amount in the waste-heat boiler auxiliary burners required to augment the kiln exit gases. This fuel rate was 27 per cent. on fuel oil with a heat content of 10,000 calories per kilogram. Translating this into our terminology (1 calorie = 3.968 B.T.U.; 1 kilogram = 2.204 lb.; 1 ton = 6 bbl.), the output was 1,200 bbl. per day per kiln, at a total fuel consumption amounting to 1,775,000 B.T.U. per bbl.

With the installation of the filters the kiln output was gradually stepped up from 200 tons per day to the cooler limit of 250 tons per day, at the same time reducing the fuel rate from 27 per cent. to 20 per cent. After the second week of operation no further fuel was required for the waste-heat-boiler auxiliary burners, except when starting the kilns. Expressed in terms more familiar to us, the present production is 1,500 bbl. per kiln per day, at a fuel rate of 1,315,000 B.T.U. per bbl.

It may be interesting to note that before the installation of the filters the feed ends of the kilns were equipped with 10 to 12 m. of chains installed to keep down the dust going out with the waste gases. When the filters were put in, these chains were removed, and the usual spiral plows installed, the result being that with the reduction in the kiln draft from 8 mm. to 5 mm., the total dust is no greater,

(Continued on page 88)

New cement-batching plant of Smoot Sand & Gravel Co. with aggregates-batching plant at left.

Another view showing aggregates bins and batchers and new cement batchers in right background.

Premixed-Concrete Manufacturer Adopts Novel Method of Operation

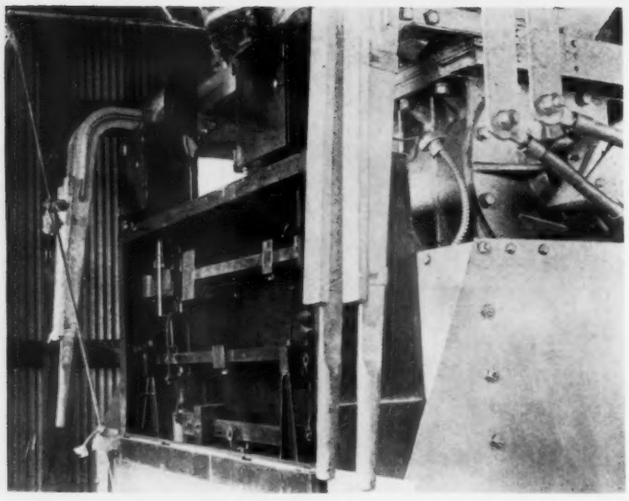
Runs Own Truck Mixers Batching Plant and Buys Batched Aggregates from Producers

THE operations of the Maloney Concrete Co., Inc., Washington, D. C., should be interesting to other producers because of the unusual conditions under which they are conducted. Some producers of ready-mixed concrete operate their own mixing or batching plants and others purchase batched materials from aggregate producers, but this company does both. In addition cement is batched from plants owned or controlled by cement companies. Trucks are loaded at three widely separated locations, eliminating long hauls within the city limits.

This business was originally started by the Maloney Paving Co., contractors, in 1929 and operated under that name until 1932 when it was changed to the Maloney Concrete Co., Inc. Starting with 9 mixer trucks delivering from one yard, the company now owns 30, all with Jaeger mixer bodies, and deliveries are now made from three different locations. Most of the mixer bodies are of 3- or 3½-yd. capacity, although a few 1- and 2-cu.yd. units are used. Nine new mixers were added this year. Both Hercules and Waukesha engines are used to rotate the mixers.

With the exception of 2 White trucks, General Motors 5-ton Model T 83 machines are used. All are fitted with U. S. Royal Cord tires. The latter are being operated by contract with the Sterrett Operating Service, which furnishes the trucks, gasoline and oil, and takes care of the repairs at a stipulated rate per mile. Towing service is also included and if an engine needs overhauling it is re-

Part of fleet of 30 motor trucks used by the Maloney Concrete Co., Washington, D. C.



Batcher and scale under one of two cement bins at the new Smoot plant.

placed overnight without loss of operating time. The concrete company furnishes its own drivers. This service is now available in several other large eastern cities.

The company originally had its own aggregate- and cement-batching equipment at its Georgetown yard, which is still the company headquarters. Trucks are now loaded with batched aggregates at the plant of the Smoot Sand & Gravel Co. a few hundred feet distant. The desired brand of cement is then added from one of a number of cement companies' batching plants located near. Separate cement-batching plants are maintained by the Lone Star Cement Co., North American Cement Corp , and Lehigh Portland Cement Co. The Washington Building Lime Co. operates a plant handling Capitol cement, and one operated by the Potomac Storage Co. handles Penn-Dixie, Hercules, Medusa, Universal-Atlas and several other brands. This group serves the west and northwest sections of the city and the territory across the Potomac River.

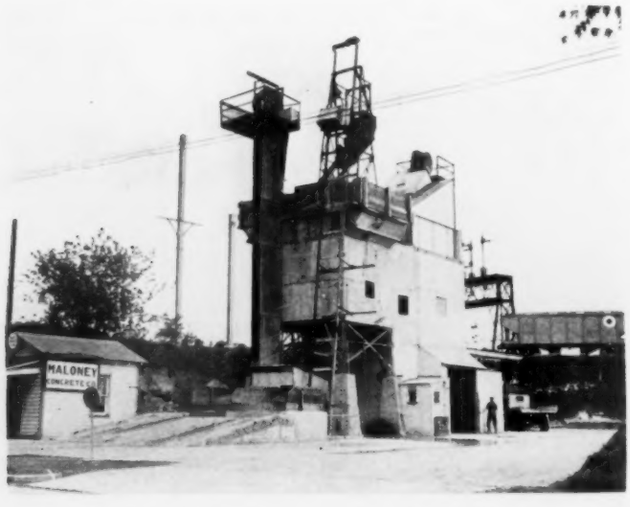
The southern and southeastern sections of the city are served from the South Capitol St. yard of the Smoot Sand & Gravel Co. near the foot of Capitol St. Aggregates are first batched into the mixer trucks, at the company's bins. A new plant erected by the aggregate company in 1934 is used to batch the cement. This plant actually consists of two complete plants located side by side. Each plant has a 4-compartment Blaw-Knox steel bin with a total capacity of 750 bbl. These eight bin compartments are leased out to the various cement companies.

Cement is unloaded from bottom-discharge cars into a 10-in. by 27-ft. Link-Belt inclined screw-conveyor driven by a 10-hp. Westinghouse Type-S gearmotor. There is also a hopper which can be put in place for unloading from box cars. The screw-conveyor discharges to a bucket-elevator. A concrete ramp is also provided so cement can be dumped from trucks into the screw-conveyor. The Link-Belt bucket-elevator operates on 66-ft. centers and is driven by a 20-hp. Westinghouse gearmotor.

The cement is discharged from the elevator through a short screw-conveyor to a longer screw. Two openings at each end with flop gates in each opening allow the material to be discharged into any of the eight bin compartments. Blaw-Knox rotary gates under each compartment feed cement to a Blaw-Knox 3,000-lb. weighing batcher under each of the two bin units.

The Maloney Concrete Co. owns a batching plant at First and M St., N. E., which serves the eastern and northeastern sections of the city. This plant was erected in the summer of 1934. Trucks bring the sand and gravel to the plant where a Link-Belt bucket elevator handles the sand and a Galion skip hoist places the gravel in a Blaw-Knox steel bin having 3 compartments with a capacity of 60 tons each. A 4-cu.yd. Blaw-Knox batcher, equipped with a Fairbanks scale, weighs out the aggregates.

Cement is unloaded from cars into a 60-ft. Columbus screw-conveyor. A Link-Belt bucket-elevator raises it to a Butler steel bin having three 300-bbl. compartments. The cement is weighed in a 3,000 lb. capacity Blaw-Knox batcher. A screw-conveyor carries the batched cement to a point under the aggregate bin, where both materials are discharged simultaneously into trucks.



Cement- and aggregates-batching plants owned by Maloney Concrete Co.

Winning a Trophy (from page 30)

tant to choose a man who would be proud of the job he had to perform.

The man chosen made it his business to get to each and every place in the plant where men were working and insist that they read the sign. Whenever he had something special to advertise he carried a 4-in. chime bell which he rang to attract attention.

The success of this stunt brought another suggestion from one of our men. He secured a few large stand-up posters used by merchants for window displays. Let's take a couple of typical displays and the use he made of them. One was a poster showing a bathing girl lolling on the beach. He transformed it into a safety poster by adding a pair of goggles and covering the original ad by pasting over it the sign, "Goggles are no good to a blind man." Another was the same girl in the bathing

(Continued on page 38)

New Plant Built in Oregon to Produce Ground Agricultural Limestone

Seasonal Demand for Product Makes Large Storage Capacity Necessary

By W. E. TRAUFFER

IN many agricultural sections of the country the production of agricultural limestone for sweetening the soil is becoming a specialized industry. Instead of building a plant for the production of lime or crushed stone as its major product, and agstone a sideline, many companies have in recent years built plants for the purpose of producing this material alone.

One of the most recent examples of this type is the plant of Limestone Products, Inc., near Dallas, Ore., which was put in operation late in 1934. A company known as the Lime Sales Co. operated a small plant on this site until January, 1934, when the present owners took it over. The old buildings and bins were torn down and new ones built and most of the old equipment replaced. The only major piece of old equipment retained was the primary crusher. The new plant has a capacity of about 10 tons per hr. of "Dallas Ground Limestone." This material is sold with a guaranteed content of not less than 68 per cent. of $CaCO_3$ and with a fineness of 100 per cent. through 10-mesh, 62 per cent. through 50-mesh and 30 per cent. through 100-mesh. Actually the product averages 75 per cent. $CaCO_3$ and 5 per cent. $MgCO_3$. The bins and buildings are of timber with concrete foundations and corrugated-metal roofing and siding.

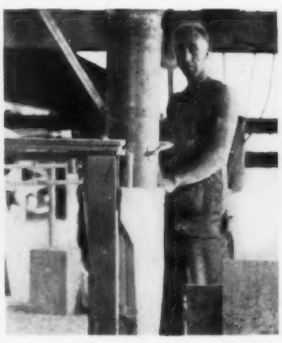
The deposit consists of 160 acres of high-calcium limestone with an overburden averaging about 6 ft. in depth. It is planned to adopt hydraulicking methods for the removal of this material during the winter. The stone is known to have a depth of at least 50 ft. and a 35-ft. face is being worked at present. Ingersoll-Rand Jackhamers are used for both primary and secondary drilling and DuPont 40-per cent. straight nitroglycerin is used for all shooting. An electric blasting machine is used for primary shots and fuse for block holes.

Stone is loaded by hand into two Ford 1½-ton dump trucks. These haul it a few hundred feet to a hopper which feeds an Acme Size 9¾ jaw crusher. This reduces the stone to 1½ in. minus and discharges it on an 18-in. Bodinson inclined belt-conveyor which operates on 24-ft. centers. The conveyor feeds the stone to the Williams Universal hammer-mill. A Bodinson belt-bucket elevator, on 34-ft. centers and with 14-in. by 8-in. buckets, feeds the pulverized product through a swinging spout to the three compartments of a 250-ton storage bin. A Western fan connected to the hammer-mill feed spout discharges to the elevator.

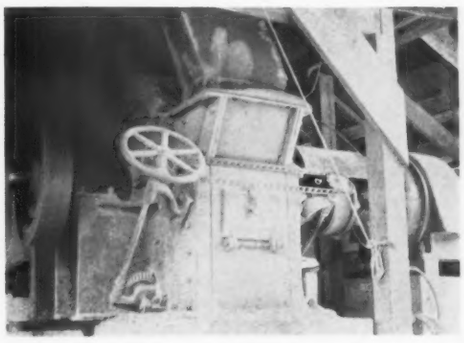
Pulverized limestone is withdrawn from storage through three spout baggers. Jaite 4-ply paper bags of 100 lb. capacity are used and these are checked on Fairbanks platform scales. The packed bags are moved by hand trucks to the storage shed which has a capacity of 1,000 tons of sacked material. Due to the seasonal demand for this product, larger storage capacity was found to be necessary. Five stacks of a capacity of 450 tons each have been built up. These have timber floors and the piled sacks are covered with tarpaulins. Most shipments are made by trucks but a 2½-mile spur track connects with the Southern Pacific Ry. for railway shipments. Bulk shipments can also be made by temporarily removing one of the packer platforms and loading into trucks through one of the packer spouts. Canvas hoods are used on these trucks to prevent dust loss while loading or in transit.

Air for drilling is supplied by a Chicago Pneumatic compressor which is driven by a G.E. motor. A 40-hp. G.E. motor drives the primary crusher by a flat belt and the belt-conveyor is driven by belt and chain from the crusher shaft. The hammer-mill is driven by a direct connected 100-hp. G.E. motor and the fan and elevator by belt from the

Trucks being loaded by hand in quarry. Air drill in center.



One of the bag-packing spouts and scale.



The hammer-mill which pulverizes 1½-in. rock. Motor at right.

Plant of Limestone Products, Inc., with storage piles covered by tarpaulins.

same motor. Electric power is reduced to 440 v. for all motors.

The product of this plant is at present used almost exclusively for liming soil in this district where prunes and hops are the principal products. The installation of additional equipment to increase the capacity of the plant and to make possible the production of chicken grits is contemplated.

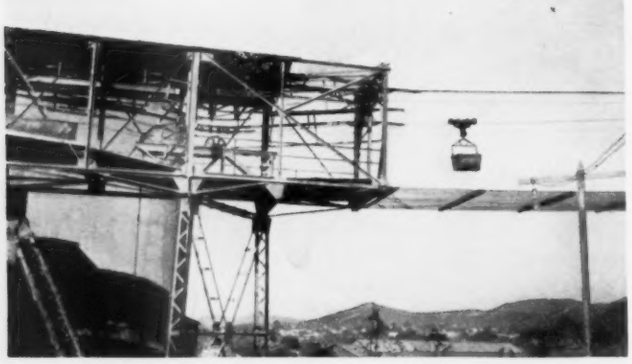
The office of Limestone Products, Inc., is in the Guardian Bldg., Salem, Ore. Harry Hawkins is president of the company and Roy Baker is plant superintendent.

Juan Minetti Plant (from page 34)

even though the production is 25 per cent. larger and in spite of the removal of the chains.

A check of the results above shows that although the plant output has been increased 25 per cent., the total fuel burned is some 8 per cent. less than formerly. Of course, quite a bit of this was burned in the auxiliary burners for power, the requirements for which have not been increased in any degree comparative to the increase in output. The present output is limited by the coolers, so that there has been no chance to determine whether a higher production would give a correspondingly lower fuel rate. It is felt by the plant authorities that 10 to 15 per cent. more clinker could be burned with no increase in fuel rate, if the coolers were adequate, and consideration is now being given to means of enlarging the present coolers, or replacing them with others.

The Compania Sudamericana de Cemento Portland is also building a complete new plant using a Polysius Lepol kiln and new Polysius devices for pneumatic mixing and pumping and for grinding.



Empty bucket (car body) leaving plant for quarry. Note wire-screen protection under tramway.

Winning a Trophy (from page 36)

suit with the wording, "You need both eyes for sights like these. Take care of your eyes."

One particularly successful poster showed a dignified man pouring—of all things—a glass of beer. We carefully covered up the glass and bottle and substituted a pair of goggles with broken lenses. When this was done he looked very much like a doctor thinking about someone's narrow escape. The wording was "Well, well, another eye saved." There were many more—some were enlarged from magazine drawings and quite a few were originals made up by members of various departments. All were read and, we believe, heeded.

Large signs were printed by using 12-in. stencils. These signs—Don't Get Hurt; Be Careful; Stay Alive; Practice Safety and similar slogans—were placed on bulletin boards when they attracted the attention of all the men entering the gate, and also were placed where they could be seen in many parts of the mill.

When our safety trophy was installed, we were a very proud group of men. The trophy was dedicated to "The men who by their whole-hearted coöperation and constant vigilance day and night have made the safety record possible and earned the safety trophy." We felt that that was the only appropriate dedication."

Each plant has its own problems which must be solved by those who are a part of it. Study of the plant atmosphere will uncover things that will interest the majority of the workers. Once they are interested the job is well under way. Then all efforts must be devoted to keeping them that way.

Employment in Illinois

Employment in the quarrying and related industries in Illinois increased in 1934, compared with 1933, in the number of men employed, in the number of man-days of work performed, and, to a less extent, in the number of man-hours worked. Total man-hours worked increased less than total man-days because of a shortening of the workday, the average shift being 6.2 hours in 1934 compared with 6.8 hours in 1933.

Reports from the operating companies to the United States Bureau of Mines for 1934 showed that 56 plants were in operation with 3,268 employees who worked a total of 678,589 man-days or 4,215,629 man-hours. Compared with 1933, there was an increase of 3 per cent. in men employed, 9 per cent. in man-days worked and 0.2 per cent. in man-hours of employment. The average employee worked 208 days, compared with 196 days in the previous year. Due to the shorter workday in 1934, the average hours of employment per man declined, from 1,324 hours in 1933 to 1,290 hours in 1934.

Accidents in and around the plants during 1934 resulted in the injury of 193 employees; fortunately none of the accidents were fatal. The accident-frequency rate, that is, the number of employees injured per million man-hours of employment, was 45.8; this was an increase over the previous year's rate which was 31.9.

Tentative Sizes of Coarse Aggregates Offered by Joint Committee

Expected to Lead to Simplification of Specifications and Production Economy

THE work of the Joint Technical Committee of the mineral-aggregates associations — the National Crushed Stone Assn., the National Sand & Gravel Assn. and the National Slag Assn.—seeking the development of standard sizes for aggregates, as reported in PIT AND QUARRY in June, has been progressing. The recommendations of the committee have been submitted to the Division of Simplified Practice of the U. S. Department of Commerce as a basis for a simplified-practice program. A coördination of purchase specifications, with resulting economy to the aggregates industries, is the end sought.

The accompanying tables show the sizes (Table I) and the typical uses (Table II). The sizes are divided into two groups, A and B, each of which is subdivided into "primary" and "combined and modified" sizes. The primary sizes are those separate sizes which, when mixed in the proper proportions, make the combined gradings. The modified sizes are those required for somewhat specialized uses needing somewhat more or less of the finer material.

The sizes outlined are tentative only and revisions are already under consideration. However, they have already found wide acceptance and form the basis for specifications of the American Society for Testing Materials, the American Concrete Institute, the Federal Specifications Board, the American Assn. of State Highway Officials, several state highway departments, and many other organizations.

Acceptance of the proposed sizes by producers, who will be asked by the Division of Simplified Practice to vote by mail on their adoption, does not represent a promise to make immediate changes in plant practice to conform with them, because changes must first be made in the specifications of consumer groups. Acceptance by producers indicates only that they consider these sizes suitable for standardization and that they will be willing to comply with them, if and when the consumer groups base their specifications on them. The use of square-opening testing sieves to express the gradings has no bearing on the shape of the screen openings required in plant practice.

The two groups, A and B, have been retained, in spite of the apparent desirability of having only one group, in order to make this first step toward standardization easier. The separation recognizes differences between the materials available in different localities. Local consumers will be urged to select as the basis for their specifica-

Table I.—TENTATIVE SIZES OF COARSE AGGREGATES

Proposed by the Joint Technical Committee of the Mineral Aggregates Associations

Size No.	Nominal Size Sq. Openings (*In.*)	Approx. Size Rd. Openings (*In.*)	Amounts Finer than Each Sieve (Square Openings) Percentages by Weight										
			4"	3 1/2"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8	No. 100
Group A														
PRIMARY SIZES														
1A	2–3 1/2	2 1/2–4 1/4	100	90–100		0–15								
2A	1–2	1 1/4–2 1/2			100	90–100	35–70	0–15						
3A	1/2–1	5/8–1 1/4					100	90–100		0–15				
4A	No. 4–1/2	1/4–5/8							100	90–100	40–75	0–15	0–5	
5A	0–No. 4	0–1/4								100		75–100		10–30
COMBINED AND MODIFIED SIZES														
12A	1–3 1/2	1 1/4–4 1/4	100	90–100		25–60		0–15						
23A	1/2–2	5/8–2 1/2			100	90–100		20–55		0–15		0–5		
234A	No. 4–2	1/4–2 1/2			100	95–100		35–70		10–30		0–5		
34A	No. 4–1	1/4–1 1/4					100	90–100		25–60		0–10		
345A	0–1	0–1 1/4					100	90–100		30–65		10–25		0–10
45A	0–1/2	0–5/8							100	90–100				0–20
3A (Mod.)	No. 4–1	1/4–1 1/4					100	90–100	40–75	5–20		0–5		
4A (Mod.)	No. 8–1/2	1/8–5/8							100	90–100	40–70	5–25	0–5	
5B (Mod.)	No. 8–3/8	1/8–1/2								100	90–100	10–30	0–8	
G1[2]	No. 8–1 1/2	No. 10–1 1/2[1]					100	75–100		50–80		25–35	0–4	
G2[2]	No. 8–1 1/2	No. 10–1 1/2[1]					100	65–100		35–75		5–25	0–4	
G3[2]	No. 4–1 1/2	No. 4–1 1/2[1]					100	60–95		25–50		0–3		
Group B														
PRIMARY SIZES														
1B	2 1/2–3 1/2	3–4 1/4	90–100	35–70	0–15									
2B	1 1/2–2 1/2	1 3/4–3		100	90–100	35–70	0–15							
3B	3/4–1 1/2	7/8–1 3/4				100	90–100	20–55	0–15					
4B	3/8–3/4	1/2–7/8						100	90–100	20–55	0–15			
5B	No. 4–3/8	1/4–1/2								100	90–100	0–20	0–5	
6B	0–No. 4	0–1/4									100	85–100		10–30
COMBINED AND MODIFIED SIZES														
12B	1 1/2–3 1/2	1 3/4–4 1/4	90–100[3]		35–70		0–15							
23B	3/4–2 1/2	7/8–3		100	90–100		25–60		0–10					
34B	3/8–1 1/2	1/2–1 3/4				100	90–100		30–65		0–10	0–5		
3A (Mod.)	No. 4–1	1/4–1 1/4					100	90–100	40–75	5–20		0–5		
345B	No. 4–1 1/2	1/4–1 3/4				100	95–100		35–70		10–30	0–5		
45B	No. 4–3/4	1/4–7/8						100	90–100		20–55	0–10	0–5	
456B	0–3/4	0–7/8						100	90–100		30–65	10–25		0–10
56B	0–3/8	0–1/2								100	90–100			0–25
5B (Mod.)	No. 8–3/8	1/8–1/2								100	90–100	10–30	0–8	
45B (Mod.)	No. 8–3/4	1/8–7/8						100	90–100		30–65	5–25	0–5	
G1[2]	No. 8–1 1/2	No. 10–1 1/2[3]					100	75–100		50–80		25–35	0–4	
G2[2]	No. 8–1 1/2	No. 10–1 1/2[3]					100	65–100		35–75		5–25	0–4	
G3[2]	No. 4–1 1/2	No. 4–1 1/2[3]					100	60–95		25–50		0–3		

[1] Actual size limitations specified by A.R.E.A.

[2] The requirements for grading depend upon the percentage of crushed particles in the gravel. Size G1 is for gravel containing 20 percent or less of crushed particles; size G2 is for gravel containing more than 20 percent and not more than 40 percent of crushed particles; size G3 is for gravel containing crushed particles in excess of 40 percent.

[3] 100 percent. finer than 4 in.

Table II.—TYPICAL USES FOR GROUP A AND B SIZES

Group A

Typical Uses	Recommended Sizes															
	1A	2A	3A	4A	5A	12A	23A	234A	34A	345A	45A	3A (Mod.)	4A (Mod.)	5B (Mod.)	G1	G2	G3
Water-Bound Macadam																	
Coarse Aggregate	×	×				×											
Filler					×												
Black Base																	
Coarse Aggregate		×				×											
Choke				×									×				
Bituminous Macadam (Penetration Type)																	
Coarse Aggregate		×															
Choke				×									×				
Seal														×			
Bituminous Road Mix																	
Mixing Course												×					
Choke														×			
Seal														×			
Drag Leveling Course																	
Leveling Course													×				
Seal														×			
Bituminous Surface Treatments																	
Cold													×	×			
Hot													×	×			
Bituminous Plant Mixes[1]																	
Traffic-Bound Surfaces										×	×		×				
Stabilized Surfaces					×					×	×						
Portland-Cement Concrete				×				×	×								
Railroad Ballast																	
Stone or Slag		×	×				×										
Gravel															×	×	×
Roofing Granules				×													
Sewage Filtration	×	×															

Group B

	Recommended Sizes																	
	1B	2B	3B	4B	5B	6B	12B	23B	34B	3A (Mod.)	345B	45B	456B	56B	5B (Mod.)	45B (Mod.)	G1	G2	G3
Water Bound Macadam																			
Coarse Aggregate	×	×					×												
Filler						×													
Black Base																			
Coarse Aggregate		×					×												
Choke				×								×							
tuminous Macadam (Penetration Type)																			
Coarse Aggregate		×																	
Choke				×															
Seal															×				
Bituminous Road Mix																			
Mixing Course									×	×									
Choke															×				
Seal															×				
Drag Leveling Course																			
Leveling Course																×			
Seal															×				
Bituminous Surface Treatments																			
Cold															×				
Hot															×	×			
Bituminous Plant Mixes[1]																			
Traffic Bound Surfaces													×	×		×			
Stabilized Surfaces						×							×	×					
Portland Cement Concrete					×						×	×							
Railroad Ballast																			
Stone or Slag			×					×											
Gravel																	×	×	×
Roofing Granules					×														
Sewage Filtration	×	×																	

[1]For plant mixes the aggregate should consist of appropriate sizes selected from Table I combined with suitably-graded fine aggregate.

tions the group, either A or B, which best fits local conditions. This will usually be the one which leads to the least change in current specifications.

In some specifications approximately equivalent sizes from both groups have been included as alternates; thus leading to greater flexibility. In one case each one of two adjacent states, served in a large measure by the same producers, has used a different group, but it is probable that the specifications of these states are now in closer agreement than they were previously.

Editor Morrison Tells Diesel Engine History

Undoubtedly one of the most important mechanical subjects of to-day is Diesel engineering. Since the depression began such progress has been made in the development of the Diesel engine that it has become the theme of wide-spread discussion in both engineering and layman circles. For that reason a new and important work just issued from the press of *Diesel Power*, New York, will be welcomed by all those who would know the history of this contribution of science to industry.

The volume, which has been compiled and edited under the direction of L. H. Morrison, editor of *Diesel Power*, comprises 800 pages of text devoted to every interest connected with Diesel engineering. Not only are the early types of internal-combustion engines, beginning with the Huyghens gunpowder device and John Barber's coal-gas affair, presented to the reader, but the most recent improvement is concisely and interestingly explained.

One of the most valuable features of the book is found in the extended technical descriptions of the many numerous Diesel models now on the market. The work is called the Diesel Engineering Handbook, is handsomely bound in red cloth, and sells for $5.

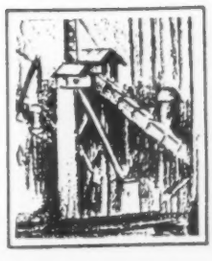
Canned Lime Now Used Makes Food Piping Hot

A new use for lime has been reported. It has been demonstrated that by encasing the tin that contains canned food in a larger can, which has unslaked lime in one compartment and water in another, and then punching holes through the walls of the water compartment so that the water will mix with the lime, there will result a chemical heat of sufficient intensity to make the food piping hot.

MEN OF THE INDUSTRY

WARREN LEWIS

WARREN LEWIS, vice president and general manager of the Longview-Saginaw Lime Works, Inc., at Birmingham, Ala., is widely known in the manufacturing end of the industry. A busy career of some twenty years started as a "no salary job" with the Standard Portland Cement Company of Leeds, Ala., of which he became assistant general manager. Subsequently he organized the Standard Building Material Co. of Birmingham, and later joined the Gager Lime Mfg. Co., of Chattanooga, Tenn. Toward the end of the depression he engaged in rehabilitation activities on behalf of Southern lime manufacturers. More recently he joined the company with which he is now associated. He is a member of the board of directors of the National Lime Association for Districts 10 and 11.



Personal Mention

William M. Black has been elected vice-president in charge of sales of the American Manganese Steel Co., Chicago Heights, Ill. Mr. Black has been with the company since 1912, when he undertook a training course in the Chicago Heights foundry, which extended over several years. After this he entered the sales department and before long was placed in charge of the Pittsburgh office. In 1927 he became eastern sales manager at New York and in 1934 was appointed general sales manager at Chicago Heights.

F. A. Beatty, who, since 1927, has been chief engineer of Lewis Foundry & Machine Co., Groveton, Pa., a subsidiary of Blaw-Knox Co., has been made vice-president. He will continue to serve also as chief engineer.

Heber G. Stout, export manager of the Chain Belt Co., Milwaukee, Wis., has departed for Europe to make a study of business conditions and the probable effects the Italo-Ethiopian conflict may have on international trade. He will visit Holland, Germany, Belgium and England, and expects to be absent two months.

Maurice Basquin, works manager for the United States Gypsum Company at their New Brighton, N. Y., plant, was the principal speaker before the Staten Island Rotary club on Nov. 20. He explained mining operations in connection with the product, and entertained his audience with a fine historical analysis of the industry.

Gene Wright, installation supervisor for the United States Gypsum Co., has been transferred from Denver, Colo., to Bismarck, N. D., where he will maintain headquarters and take care of a territory covering North Dakota, South Dakota, Montana, part of Minnesota and part of Washington.

D. S. Day, assistant sales manager of the Universal Atlas Cement Co., Minneapolis, Minn., who has been with the company for the past 28 years, of which 23 were in Minneapolis, has been promoted to be Sales Manager.

John C. Van Doorn, sales manager for the Universal Atlas Cement Co., in Minneapolis, Minn., has retired from active work after having been with the company since 1903, when he took the position of sales agent in St. Louis, Mo.

Erie L. Gale is the new assistant district sales manager for the territory served by the Des Moines plant of the Pennsylvania-Dixie Cement Corporation. His headquarters will be in the Old Colony Bldg., Des Moines, Iowa. Mr. Gale's experience in the cement industry extends over 25 years.

Lawrence J. Holzman has been named as secretary of the Parsons Engineering Corp. of Cleveland, O., and placed in charge of sales. He has been with the company since 1931.

Lloyd Leaver has resigned as vice president in charge of Mechanical Rubber Goods sales of the Thermoid Rubber Co., of Trenton, N. J. **Fred Matheis,** who has been in active charge of department routine, was elected assistant vice president to continue in its management, while **S. H. Lyons,** dean of salesmen, has been appointed Eastern manager of the department.

Bruno V. E. Nordberg is the new president of the Engineer's Society, Milwaukee. He is executive engineer of the Nordberg Mfg. Co. **K. L. Hansen,** Harnischfeger Corporation, was elected as one of the directors of the society.

N. H. Orr has been appointed general manager of sales of the Colorado Fuel & Iron Co., Denver. He was until recently identified with the American Iron and Steel Institute.

Otto de Lorenzi, identified with the Combustion Engineering Co., New York, since 1916, as an engineer, has been made assistant general sales manager.

J. Seton Gray is the new president of the Unit Holding Corporation, Milwaukee, formed in the reorganization of the old Unit Corporation of America.

John P. Bankson has been appointed Pittsburgh district sales manager for the Harbison-Walker Refractories Co. For the last five years he has been identified with the Cleveland district sales office of the same company. He is a Yale graduate.

Charles E. Wilson, vice president in charge of the merchandising department of the General Electric Co., is now directing all appliance activities of the company.

Obituary

Edward C. Wilfert, president of the Wilfert Sand & Gravel Co., of Eugene, Ore., died last month at his home in that city.

Irwin Sheldon Osborn, national authority on problems of municipal waste disposal, and vice president of C. O. Bartlett & Snow Co., Cleveland, died Nov. 2, aged 56 years. He had been connected with that company as vice president and director since 1922.

Charles E. Ulrickson, aged 63, vice president and general manager of Trinity Portland Cement Co., of Dallas, Texas, died at his home in the southern city November 15, after a 2-year illness. Mr. Ulrickson had been connected with the cement industry since 1906 when he became a member of the Cowham Cement Engineering organization.

Robert Tifft Turner, vice president and general sales manager for Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., died at the age of 49 years on Nov. 13 in New York City.

Charles E. Bridges, for many years owner and manager of the Pownal Sand and Gravel Co., of Pownal, Vt., died at his home in that city on November 12.

W. H. Bateman, plant superintendent at Sharpsville, Pa., for the Standard Slag Co., of Youngstown, Ohio, died suddenly at him home in the Pennsylvania city on Nov. 13. He was 39 years old, and is survived by his wife and children. He had been with the firm for a number of years, and was a valued member of the official staff.

Ernest Hirschberg of the Dings Magnetic Separator Company, and widely known engineer and clubman of Milwaukee, passed away on a Soo train while returning home from Northern Wisconsin on October 10. He was a graduate of the University of Wisconsin.

W. K. Smith, an employee of the Limestone Products Corporation of Racine, Wis., was killed near Waukegan, Ill., on Nov. 23, when his automobile skidded on an icy pavement into a truck.

William A. Herron, aged 74 years, died at his home in Pittsburgh on Oct. 27. He was the retired president of Lewis Foundry and Machine Co., Groveton, Pa., subsidiary of Blaw-Knox Co.

Coming Events

Dec. 9-11, 1935. Chicago, Ill.—Autumn meeting, Portland Cement Assn. Blackstone Hotel.

January 15 to September 6, 1936. San Diego, Cal.—California Pacific International Exposition, re-opens January 15, 1936, and continues to September 9.

January 18-24, 1936. Cleveland, O. Annual Road Show, American Road Builders' Assn. at the Exhibition Hall.

January 27-30, 1936. St. Louis, Mo. Concurrent annual conventions of the National Crushed Stone Assn., the National Sand & Gravel Assn. and the National Slag Assn. at Hotel Jefferson.

February 25-28, 1936, Wichita, Kans.—Ninth Annual Southwest Road Show and School, Exposition Bldg.

NEW CORPORATIONS

WALKER COUNTY STONE Co., has been chartered with a capital stock of $30,000, and succeeds to the business of the Huntsville Stone Co., of Huntsville, Tex. The incorporators include Tom Tellepson of 3900 Clay street, Houston, Tex., and E. A. Krause.

TEXAS MICA Co. has been incorporated in Dallas, Tex., by F. A. Wright, 4516 Edmonson and C. N. Crotty.

HAMILTON NATURAL CUT STONE & FLAGGING Co. has been incorporated in Fond du Lac, Wis., by B. F. Boreson, H. R. Sharpe and Ada Sharpe.

NECKLENBURG GRANITE Co. has been incorporated in Charlotte, N. C., by J. K. Bryan and E. F. Taylor.

BARYTES, INC., Joplin, Mo. Incorporators are H. W. Robertson and George V. Farris.

STANDARD SILICA CORP., 927 So. State St., Chicago; plant at Ottawa, Ill. Capital 40,000 shares common; incorporators, William C. Cook, Harry M. Nacey and Herbert Devereaux. To quarry, wash, process and sell silica sands of all types, rock, etc.

CONTINENTAL ASPHALT Co., 105 W. Adams St., Chicago, Ill. Incorporators are J. Arthur Kealy, John J. Enright, Jr., and George Hendry. To manufacture and sell asphaltic paving materials.

IMPERIAL BLUE GRANITE Co., INC., Elberton, Ga. Capital stock $50,000, divided into 500 shares of $100 par value. Incorporators are F. D. Smith, Felix Solana, H. H. Stoner and K. L. Davidson. To quarry granite and other stones, curbing and paving blocks, etc.

UNION CONCRETE PIPE Co., INC., Parker, Wash. Capital $50,000. Incorporators are Stella Ban, Frank H. and Glessner C. Souther. To deal in cement and cement products.

SPANISH LAKE QUARRY Co., St. Louis, Mo. Chartered by E. E. Held and E. L. Joaquia.

Foreign Developments

Studies of Synthesis of Dicalcium Ferrite

The studies here reported follow similar former studies on the effect of calcium fluoride on the thermal synthesis of calcium silicates and of calcium aluminates, and was undertaken to determine the effect of calcium fluoride on the thermal combination of lime and ferric oxide to calcium ferrites. Pure calcium carbonate and ferric oxide were intimately mixed in the ratio of 2 mols of lime to 1 mol of ferric oxide, *i.e.*, 2 $CaCO_3$:Fe_2O_3 or 2CaO:Fe_2O_3. There is also a monocalcium ferrite, but it is sufficient to study this ferrite of the higher lime content. The mixture was put in a platinum crucible and heated at 900 to 1,300 deg. C. for 1 hr. in an electric furnace. The heated product was then analyzed with HCl solution to determine the 2CaO.Fe_2O_3 produced. The 0.1 N HCl solution and likewise the 0.2 solutions were too weak, and the 0.3 N HCl solution just sufficient to dissolve only 2CaO.Fe_2O_3 and separate it from monocalcium ferrite CaO.Fe_2O_3 and free uncombined ferric oxide.

The systematic treatment of the heated product was (1) to determine the free lime according to the Lerch and Bogue titration method; (2) to determine the 2CaO.Fe_2O_3 produced by dissolving with 0.3 N HCl solution as above; (3) to fuse the residue with fusing mixture, dissolve it in HCl and determine the amounts of CaO and Fe_2O_3, from which the amounts of CaO.Fe_2O_3 produced and of free uncombined Fe_2O_3 were calculated; (4) to calculate the molecular ratio of the total combined lime to the total combined ferric oxide from the results at (2) and (3); and (5) to determine the specific gravity of the heated product.

Tabulation of the results showed that: (1) monocalcium ferrite CaO.Fe_2O_3 was produced at 1,000 to 1,100 deg. C. even from the raw mixture 2CaO:Fe_2O_3 (2:1) of high lime content; (2) dicalcium ferrite 2CaO.Fe_2O_3 was produced gradually at the lower heating temperatures, but the complete combination was obtained by heating at 1,200 deg. C. (3) the high specific gravity of the mixture and the monocalcium ferrite CaO.Fe_2O_3 decreased to the small value of dicalcium ferrite 2CaO.Fe_2O_3 on the nearly complete combination.

Then 1 per cent. of calcium fluoride was added to the raw mixture 2CaO:Fe_2O_3 (2:1). This sample was heated at 1,100 to 1,200 deg. C. for 1 hr. and the heated product treated systematically to study the effect on the combination of lime and ferric oxide, as above. A comparison of results shows that the addition of calcium fluoride effects the nearly complete combination of lime and ferric oxide to 2CaO.Fe_2O_3 even at 1,100 deg. C. or to nearly the same degree as the heated product heated to 1,200 deg. C. without calcium flouride. The effect of the presence of 1 per cent. of calcium fluoride is thus nearly equivalent to lowering the temperature 50 to 100 deg. C. at the temperature of 1,100 to 1,200 deg. C., which is approximately the same result as was reached in the case of calcium aluminates.

Further studies are now in progress on the effect of other fluorides on the thermal synthesis of calcium silicates, aluminates and ferrites of the hydraulic compounds of Portland cement, aluminous cement, etc.—Shoichiro Nagai and Toyotaro Yoshiura in *Journal of the Society of Chemical Industry, Japan* 38:374B-376B, August, 1935.

Notes on Cement and Corrosive Solutions

In preliminary investigations for a research on the action of corrosive solutions on hardened cement, experiments were made to observe the action of distilled water and of magnesium-sulphate and sodium-chloride solutions on porous hardened cement. It was found that the reactions between hardened cement and the magnesium-sulphate solution is much more complicated than would correspond to the equation:

$$Ca(OH)_2 + MgSO_4 = CaSO_4 + Mg(OH)_2$$

It was determined that the insoluble cement residue retains large amounts of magnesium hydroxide and sulphurtrioxide, which bear no stoichiometric relation to the amounts of calcium oxide dissolved from cement as sulphate. The components in this manner fixed can only partially be removed by washing with a sodium-chloride solution.

It was found also that the sodium-chloride solution acts zeolitically and has a powerful solvent action on the calcium hydroxide of hardened cement. Its solvent effect is stronger than that of a dilute magnesium-sulphate solution or of distilled water.

Also, the sensitivity of hardened cement to corrosive solutions is considerably reduced by the action of atmospheric carbon dioxide or by preliminary treatment with distilled water or a sodium-chloride solution.—Dr. A. Stoepoe in *Tonindustrie-Zeitung* 59: 765-768, Aug. 8, 1935.

Chemical Resistance of Slag-and-Gypsum Cement

Theoretical requirements of a cement to resist decomposition by internal and external agents are a high mechanical strength from the initial hardening; a granulometric composition such as to afford an absolute impermeability; freedom from inclination to cracking from shrinkage and heating, and an intrinsic and immediate chemical resistance. These properties, says L. Blondiau in a paper presented at the 14th Congress of Industrial Chemistry in Paris, are united in a happy combination in "supersulphated metallurgical cements," which he discusses in general and with particular reference to a slag-and-gypsum cement produced at a Belgian plant under the trade name "Sealithor."

Such a cement is composed of a basic blast-furnace slag granulated by sudden cooling, activated by a high addition of calcium sulphate. The index of hydraulicity according to Vicat (taking into account the lime combined with sulphate) is greater than unity and the lime concentration in the liquid phase of the hydration is always below the limit of hydrolysis of tetracalcium aluminate. Consequently such a cement has a high and immediate chemical resistance, dependant on no secondary reaction.

By their very nature these cements can not claim the high initial strength of the aluminous cements, but they nevertheless give high mechanical strengths, which increase with time. They are very satisfactory from the point of view of the preservation of steel in the concrete (the metal is not altered) and also of the tangential adhesion of the steel to the mortar. They have a good resistance to shock and to wear. They are ground very fine, as is necessary with slag.

Tests of impermeability and of resistance to pure water gave good results. These cements are favorable in resistance to selenitic waters, the Anstett test, and solutions of sugar, calcium bisulphate, ammonium nitrate, magnesium and sodium chlorides, sodium and ammonium sulphides and magnesium sulphate. Their resistance is also very good in the presence of weak acids, saponifiable oils, etc. In using them it is necessary to avoid mixing them with Portlands, which lowers their chemical resistance.—*Revue des Materiaux de Construction et de Travaux Publics*, No. 309, pp. 152, June, 1935; *Tonindustrie-Zeitung* 59:571-573, June 13, 1935.

German manufacturers, according to late reports, are now producing a spongy and porous heat-insulation material similar to natural pumice by synthetic methods. This is accomplished by treating blast-furnace slag in the molten state with less water than would be required to granulate it. The effect is produced by steam generated through the contact of water with hot slag.

Traffic News and Comment

Recent I. C. C. Decisions

Cement—In response to fourth section application No. 15,798 the Commission has authorized the Missouri-Kansas-Texas, the Missouri-Pacific and the Colorado & Southern to establish and maintain rates on cement from Chanute, Humbolt, Iola, Mildred and Fort Scott, Kansas, and from Dewey, Oklahoma, to stations on the Colorado & Southern in New Meixco via the M. K. T., Council Grove, Kansas, M.-P., Pueblo, Colorado, and the C. & S. using the lowest rate that may be constructed over any line on the basis of scale IV rates prescribed in Western Cement Rates, 48 I. C. C. 201, in order to meet the short line competition, subject to a 50% circuity limitation. I. C. C. F. S. O. No. 12,081.

Sand—On reconsideration the Commission has found additional amounts of reparation due the Hart Glass Manufacturing Company on Silica sand from the Ottawa, Illinois, district to Dunkirk, Indiana, under prior findings in 188 I. C. C. 99. I. C. C. Docket No. 16,250, Indiana State Chamber of Commerce v. B. & O. et al.

On further consideration the Commission has awarded reparation amounting to $25,639.75 under findings in report in 188 I. C. C. 99 that the rates on molding sand from points in Massachusetts, New York and New Jersey to Oak Street Station, Indian Orchard, Springfield and Holyoke, Mass., were unreasonable. I. C. C. Docket No. 21,133, Chapman Valve Manufacturing Company v. B. & A. et al, and Sub No. 1, Worthington Pump and Machinery Corporation v. Pennsylvania et al.

New Complaints Filed

Agricultural Limestone—Alleging unreasonable rates on agricultural limestone from Bluffton, Ind., to destinations in Illinois a cease and desist order and reparation are prayed for in a complaint filed by A. B. Cronk, 1024 Hume Mansur Building, Indianapolis, Ind., in I. C. C. Docket No. 27,184, Erie Stone Company, Indianapolis, Ind., v. N. Y. C.

Crushed Stone, Sand and Gravel—The Commission has suspended from October 25 until May 25 schedules published by Agent Pope in supplement 13 to his I. C. C. No. 1,540 and supplement 93 to his I. C. C. No. 1,635, which proposed to cancel the present emergency charge on crushed stone, sand and gravel and related articles on traffic moving principally between points in southern states and to apply in lieu thereof a specific emergency charge of 5c per ton except that no emergency charge would be applicable where the line haul rate is 60c or less. This would result in both increases and reductions. I. and S. Docket No. 4,150.

Sand—Reparation is sought on an allegation of a reasonable rate on Silica sand from Ottawa, Ill., to Baltimore, Md., in a complaint filed by Leo Tessler, 1148 Manor Ave., New York, N. Y., in I. C. C. Docket No. 27,200, Standard Gas Equipment Corporation, Baltimore, Md., v. C. B. & Q. et al.

New rates and reparation are asked for and violation of section 1 alleged on sand from Hancock, W. Va., to Baltimore, Md., in complaint filed by L. P. Brandt and Earl W. Cox, 1018 S. Wabash Ave., Chicago, Ill., in I. C. C. Docket No. 27,201, Swindell Brothers, Inc., Baltimore, Md., v. B. & O.

Reparation is sought on an allegation of unreasonable rates on sand from Blackwood, Cedarville, Glanloch, Mount Holly, Millville and Newport, New Jersey, and Mechanicville and Selkirk to Boyertown, Pa., in complaint filed by L. P. Brandt and Earl W. Cox, 1018 S. Wabash Ave., Chicago, Ill., in I .C. C. Docket No. 27,212, Eastern Foundry Company, Boyertown, Pa., v. C. R. R. of N. J. et al.

Legislation

At the annual meeting of the Association of Practitioners before the Interstate Commerce Commission held in New York City October 23 a committee was appointed to make a report and recommendation on the Wagner Bill, S. 2,944, which would have the effect of barring all practitioners before the Commission who are not licensed attorneys. The committee reported against the Bill and the Association adopted a resolution opposing the Bill and directing the executive committee to take all steps it may consider necessary to prevent the passage of this Bill or any other similar bill by Congress. This Association was formed six years ago and is limited in its membership to registered practitioners before the Commission. This is the first time that any action has been taken by the Association on any proposed legislation.

Motor Carrier Regulation

Members of the Rates and Tariffs Committee of the American Trucking Associations, Inc., called at the Bureau of Motor Carriers on November 21 and told Commissioner Eastman and other officials of the Commission that the Association would publish a National Truckers Classification and would have it ready for use by regional rate publishing committees and individual truckers by January 15, the date on which initial motor truck rates must be filed with the Interstate Commerce Commission.

In a report on November 20 the Association announced a decision to publish a National Motor Freight Classification which would better fit the motor industry than the classification which is used by rail carriers. In going from one classification territory to another by rail there is a difference in the classification of a great many articles. In official classification territory there are seven classes with ten in Western territory and twelve in Southern territory. The proposed Motor Freight Classification will have a much smaller number of classes and these will apply in all parts of the United States.

In drafting the new classification particular care will be taken to preserve for the shipping public all the natural advantages of truck transportation which they have at present. The Committee expects to cover all commodities handled by motor carriers and are enlisting the services of truck operators from the 48 states and the District of Columbia in order to make this classification cover the needs of the entire industry. It is not expected that the first publication will be 100% satisfactory but that it will be amended from time to time to meet the needs of the industry.

The publication of this classification will not preclude the filing of a classification by an individual trucker or a group of truckers but the tremendous expense in the publication of an individual issue would be so great that it is likely that all truckers will become parties to the National Classification. Any trucker can, of course, file such exceptions as he wishes to meet his individual needs.

Questions and Answers

Q.—We have a regular movement of sand and gravel from our plant to a point in our state which travels over two railroads. The first road has two junction points with the second and insists on delivering the cars to the second road at the more distant junction point, which means that the shipment takes an extra day in transit. Both of these railroads reach into other states, and while this particular shipment is not in interstate commerce can the Interstate Commerce Commission compel the railroad to deliver the shipment to the second road at the nearer junction point?

A.—In several cases before the Federal Courts they have ruled that Congress does not possess the authority to regulate the internal commerce of a state as such, but it does possess the power to foster and protect interstate commerce and to take all measures necessary or appropriate to that end, although intrastate transactions of interstate carriers may hereby be controlled. Your question does not indicate that your particular shipment would have any relation to interstate commerce, and as Congress carefully defined the scope of its regulation and expressly provided that it was not to extend to purely intrastate traffic your course of action is with the Public Utilities Commission or the Railroad Commission of your state. In cases before the Supreme Court reported in 27 Sup. Ct. Rep. 585 and in 21 Sup. Ct. Rep. 115 the court said, "the power of the state to regulate railroads extends to securing to the public reasonable facilities for making connections between different carriers." Most states have provided their regulating commissions with authority to compel the carriers to provide interchange facilities and no doubt your commission has the authority to order the railroad to make delivery at the first junction point if it finds this to be in the public interest.

Q.—We recently received a shipment of machinery from a point in Pennsylvania which was unloaded into the local freight house here in Indiana. As we did not move the machinery out of the freight house until four days after it arrived the agent assessed storage charges. Does a railroad company have the right to charge storage on interstate commerce?

A.—The Supreme Court has ruled that transportation includes storage of goods after arrival at destination. In report in 44 Sup. Ct. Rep. 408, the Court uses the following language, "the statute clearly expresses the intention to put terminal and storage charges on the same basis as freight and to make them as much a part of the contract of transportation as the freight." This clearly indicates that the railroad has the right to assess storage charges.

Lidgerwood Mfg. Co. Buys Mundy Hoisting Engine Firm

The Lidgerwood Manufacturing Co., Elizabeth, N. J., has acquired the J. S. Mundy Hoisting Engine Co., Newark, N. J. The latter company will continue the manufacture of the Mundy line of hoisting equipment, as well as the servicing of Mundy machinery now in the field. Inquiries relative to Mundy equipment should be directed to the J. S. Mundy Hoisting Engine Co., P. O. Box 18, Elizabeth, N. J.

Combustion Engineering Co. Appoints New Representatives

The Combustion Engineering Co., Inc., 200 Madison Ave., New York, N. Y., announces the appointment of the Wilson Machinery & Supply Co., Inc., Lexington, Ky., and William Franklin, Buffalo, N. Y., as representatives of its Industrial Stoker Division for the sale of C-E stoker units, a line of underfeed stokers applicable to boilers from the small size heating units to power boilers developing up to 400 hp.

The Industrial Combustion Co., Allegheny Ave. and Boudinet St., Philadelphia, Pa., has been appointed representative for the territory comprising southeastern Pennsylvania, southern New Jersey and Wilmington, Del.

At a meeting of the directors of the Blaw Knox Co., Pittsburgh, Pa., E. R. Crawford, president of the McKeesport Tin Plate Co., was elected a director.

New Machinery and Supplies

This Dipper Takes 32 Cubic Yards in One Bite

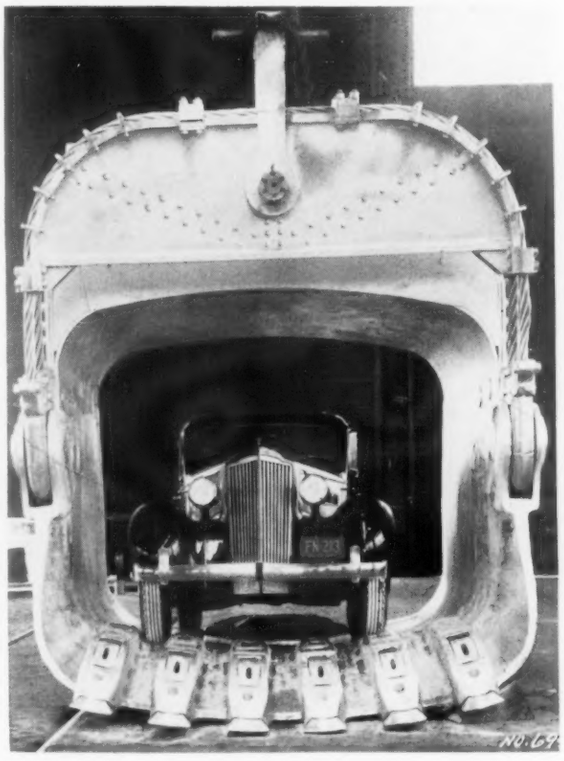
One bite of 32 cubic yards (level full) is declared to be the record of what is called the world's largest power shovel dipper, recently developed by The Marion Steam Shovel Company, Marion, Ohio, and placed in coal stripping service by The Northern Illinois Coal Corporation, near Wilmington, Illinois.

Some idea of the size is given in the above illustration showing an automobile mistaking it for a garage. There is still plenty of room left on each side to change a couple of tires.

Further comparative statistics reveal one dipper load would fill the average kitchen measuring 9 ft. x 12 ft. x 9 ft. high. It would take, it is said, 32 wagon loads of dirt to fill this dipper. It would accommodate 32 men, standing up, comfortably. Two complete dippers full would fill the average railroad coal car.

The major problem in developing this dipper was to increase its capacity without making it necessary to resort to a larger shovel. This was accomplished by building the dipper of a light weight metal alloy, which gave the required additional capacity without affecting the wearing qualities.

The demand for greater capacity in the coal stripping industry is given by the Marion company as the reason for this engineering development. They are among the pioneers in this field, and a number of their coal-stripping excavators, ranging from 4 to 32 cu. yds. are in daily operation.



Not a garage, but big enough for one.

Link-Belt Has New Bearing Unit Line

The Link-Belt Company of Chicago announces a new line of bearing units which are to be known as Link-Belt Shafer Self-Aligning Roller Bearing "Series 400." Shafer self-aligning double-row roller bearings are used in Link-Belt mountings, which are said to make an excellent combination for general service. These units are available for pillow blocks, flange bearings, hangers, and take-ups.

The advantages of the new combination are pointed out as: 1. Ability to carry (a) radial loads, (b) thrust loads, (c) radial and thrust loads combined. 2. Inherent self-alignment. Self-alignment of the Shafer roller bearings is provided by concave rollers between convex outer races and a spherical inner race on the sleeve, which is free to deflect with a shaft temporarily misaligned or out of line because of inaccuracies of installation. The rollers travel in a true path on accurate races. Labyrinth seals protect the bearings. Bores are ground for direct shaft application. The dimensions, radial load capacities, list prices and other data on these new roller bearings are given in a new book No. 1494.

Self-aligning roller bearing.

Halafax Explosives For All Weathers

The Halafax Explosives Co., 810 South Spring St., Los Angeles, Cal., is producing, at its new plant near Saugus, Cal., a full line of explosives ranging from low-strength, free-running to the higher nitroglycerin equivalents. Halafax powders are declared to be insensitive to sudden changes of temperature and to be virtually unaffected by freezing and by extreme heat. Chemical and physical stability is said to be another feature.

Chlorate of potash is the initiating force in Halafax explosives and this material is made by an electrolytic method which is said to remove all impurities. The chlorate is in the form of a dry salt and an inert liquid ingredient was developed to decrease the sensitivity of the explosive element without diminishing its explosive properties. This liquid is a non-explosive product obtained from the nitration of toluene, but in combination with the Halafax formula is said to produce an explosive rate possessing the characteristics of di- and tri-nitro-toluene.

Halafax explosives are available in three grades. Halamite: 20 strength and up has average water resistance and is equivalent to dynamite in disruptive breakage. Halatin: 20 strength and up, is a gelatinized plastic, especially water resistant, and is the equivalent of gelatin in disruptive breakage. Halafax Free Flow: Is free flow with average water resistance and is made in three grades. "B" is the equivalent of black powder in disruptive force. "BB" is the black powder equivalent in deflagration plus the detonating force of 20 Halamite. "BBB" is the black powder equivalent in deflagration plus the detonating force of 40 Halamite.

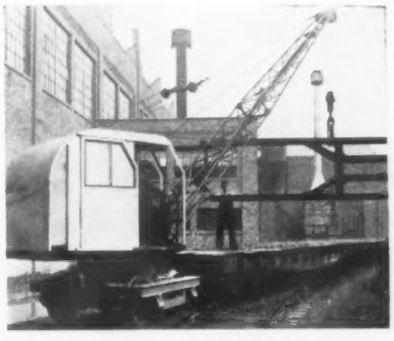
Vibratory Screen for Laboratory Work

The Paterson Engr. Co., for which Arthur T. Ward, 50 Church St., New York, N. Y., is distributor, has developed a vibratory screen for laboratory work. This screen has a vibrator element supported in an inverted, U-shaped metal frame. The sieve basket fits into a quick-set clamp at the bottom of this frame. The vibratory motion is obtained through the use of a motor-driven unbalanced weight which can be exactly adjusted to the particular requirements of the material being screened. The motor is hermetically sealed in a dust and explosion-proof hood and operates on any lighting circuit.

Flat or cone-shaped sieves are provided, having a steel edging, and these are fastened by a sieve lock ring through a few turns of a wing nut. Duplex sieve baskets are available and cotton (cheese) cloth discs may also be used. The screen may be used for any liquid or solid material. Except for the aluminum motor hood all metal parts are cadmium plated.

Bantam Weight Rail Crane Announced

A new P&H Bantam Weight Crane, self-propelling on standard rail wheels and designed for spur handling of materials and car switching, is announced by the Harnischfeger Corp., of Milwaukee. The new unit is declared to have some noteworthy features in its all-welded construction to obtain greater structural strength with a minimum of weight. The 25-foot boom of welded tubular construction is said to provide a wide working radius and lifting capacities with 75 per cent. stability ranging from 7730 lbs. at 10 feet radius to 2360 lbs. at 25 feet. This, together with the quickly attached clamshell bucket or magnet, makes it a practical unit for a wide variety of uses.



Leight-weight railway crane.

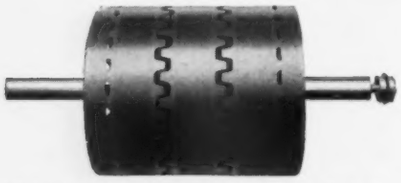
Powered by the Ford V-8 motor, the Bantam Weight Rail Crane is described as employing chain drive to each axle and as exerting a drawbar pull from standstill of 3150 lbs.—sufficient for handling from 2 to 7 freight cars depending upon their loads. Travel speeds range from 1.8 miles per hour in low gear to 6.5 miles per hour in high.

Mounted on a husky, all-welded rail-

road-type truck with standard gauge rail wheels, bearing journals and car couplings, the Bantam Weight Rail Crane has a wheelbase of 5 ft. 6 inches, and overall length of 8 ft. 5½ inches. The height of the entire machine is 10 ft. 6 inches, and total weight is 21,000 lbs.

Heat-Dissipating Magnetic Pulley

The Dings Magnetic Separator Co., of Milwaukee, is offering a new high intensity magnetic pulley, which, it is claimed, so dissipates heat as to insure the greatest degree of magnetic intensity. The pulley has transverse and longitudinal radiating ducts. Each coil is wound upon its own bobbin, which forms the core and the two poles. Separate bobbins are mounted upon the pulley shaft, each bobbin being securely keyseated to the shaft.



High-intensity magnetic pulley which dissipates heat.

The outer and inner faces of the bobbin are corrugated. This structure, it is said, presents a maximum radiating surface and a maximum dissipation of heat.

The coil covers are of heavy bronze, the company states. There is no short circuiting of the lines of force between the two poles as in the case when steel spacer rings are used. Each pulley is supplied with set collars, bronze collector rings with double contact brushes for each collector ring, dust proof collector ring housing and approved steel switch cabinet in which is mounted a pilot lamp with bullseye indicator to show when current is flowing, fuse, switch and special kick absorbing resistance to absorb the counter EMF.

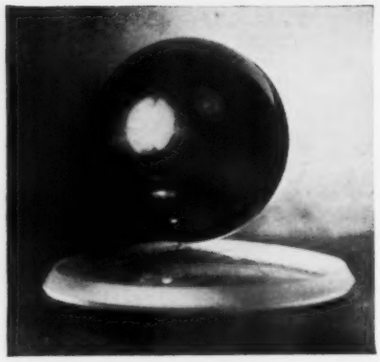
New Type Brake Lining by Thermoid Rubber Co.

The Thermoid Rubber Co., of Trenton, N. J., has developed a new type of brake lining, called Thermoid BX Woven, for use on heavy industrial machinery and equipment. It has as its base asbestos tape that is woven in a single thickness and therefore, has no plies to separate under severe service conditions. This tape is woven of heavy yarn containing brass wire and is impregnated with a highly heat-resistant Bakelite resin. The resultant product is a dense, flexible material consisting of 70% asbestos and 30% resin. It is ground on the wearing surface, ready for application. The company claims the lining has a very high coefficient of friction under all conditions of service; gives quick deceleration and "high holding," and will stand heats above 900° F. without deteriorating.

New Goggle Lens in Heavy Steel Ball Test

A new goggle lens, declared to have far greater impact resistance than any lens previously used in standard eye-protection equipment is now being offered by American Optical Company. The new lens, called the 6-Curve Super Armorplate, gets its extra strength from its high curvature, according to a statement issued by the manufacturer. An indication of its superior impact resistance is provided in the account of tests used to determine its strength.

A one-inch solid steel ball was dropped on the lens from a height of ten feet. The unretouched, stop-motion photograph reproduced here shows how the camera caught the action. This photograph, said



Steel-ball test of goggle lens.

to be the first ever taken of an impact goggle lens at the moment of impact, required an exposure of only 1/100,000 of a second. The standard test for goggle lenses specifies a ⅝-inch steel ball dropped from a height of 39 inches. A height of three times the government standard, and a weight of four times the standard was used in testing.

The 6-Curve Lens is declared to be more effective in deflecting glancing blows, because of its higher curvature; and it is also stated that the curvature permits a closer fitting to the face without interfering with the eyelashes.

Portable Gravel Clay Stabilizer Plant Announced

Announcement of a new portable gravel clay stabilizer plant is made by the Pioneer Gravel Equipment Manufacturing Co., of Minneapolis, Minn. It works in conjunction with a crushed gravel plant, and is designed to prepare and mix materials for the stabilized wearing course.

The equipment is the company's answer to the ever increasing demand for a better low-cost road—a road that is dustless, durable, safe and smooth regardless of the weather.

The new stabilizer plant is a one-unit outfit and, except for the conveyors, is mounted on a four-wheeled all-steel truck. The plant consists of a clay feeder, belt conveyor, clay shredder, roll crusher if necessary, pugmill, calcium chloride hopper and feeder, and a delivery conveyor. The gravel is crushed and screened in a separate plant and is delivered directly into the pugmill.

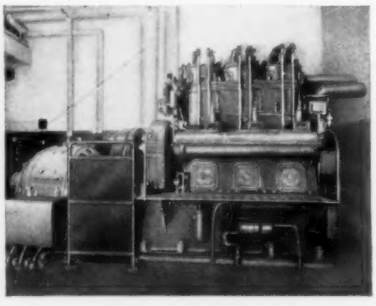
The clay is dumped through a trap onto a special type feeder which governs the amount of clay fed to the plant. A belt conveyor delivers the clay to a shredder which tears up the chunks. A roll crusher can be provided if necessary to crush rocks and flatten out the clay. The clay is then dropped into the pugmill with the gravel.

Calcium chloride is fed from a hopper on top of the plant through an automatic, adjustable feeder which controls the amount of calcium chloride. Water is added as may be necessary in order to get the desired moisture content. The pugmill thoroughly mixes and blends the ingredients and deposits the stabilized gravel on a belt conveyor for delivery to trucks or bins.

Thus the mixed material can now be delivered directly onto the prepared grade and requires only spreading and rolling in order to make a finished stabilized wearing course.

Chicago Pneumatic Tool Co. Announces New Diesels

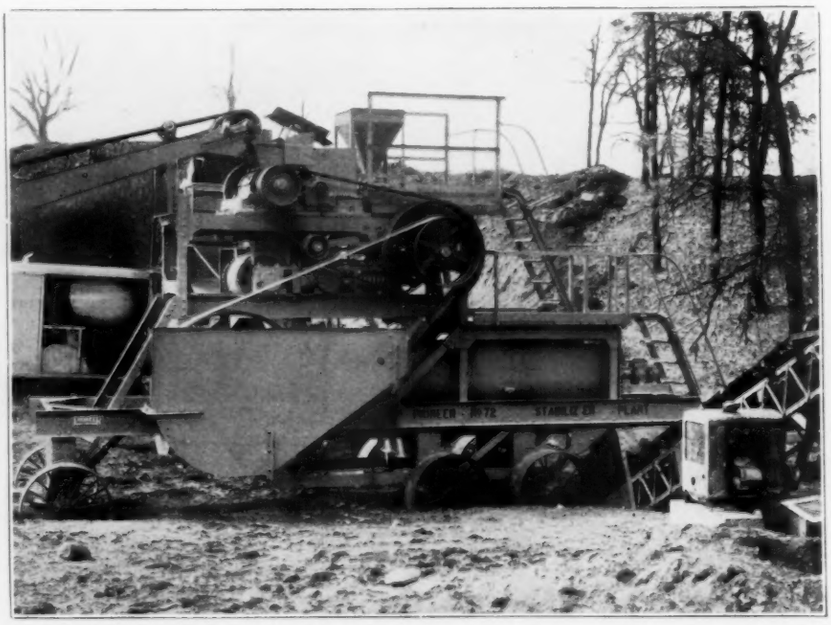
The Chicago Pneumatic Tool Co., of New York, is offering a new line of CP Diesel engines, built in sizes from 100 h.p. to 800 h.p., for which are claimed several



Front view of new Diesel engine.

features designed to make them adaptable for long, continuous, or automatic service where reliability and low operating costs are essential. These features are: four cycle, direct injection, pressure lubricated, full Diesel of the high compression type, and convertibility to a gas engine if ever required.

The engines are declared to have a wide application, and are divided into two classifications, one for general service, and the



The new portable gravel-clay stabilizer plant.

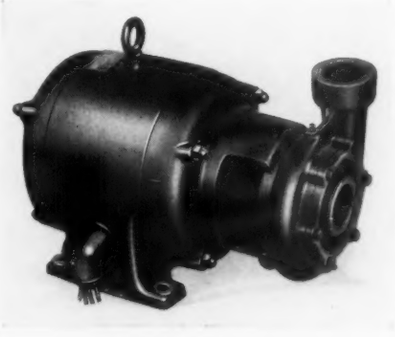
other for direct connection for electric service use. The various sizes of engines have from two to eight cylinders, and range from 100 to 400 b.h.p. at 400 r.p.m. on both types.

The manufacturers have used the Bosch system of direct solid injection on the new CP—RHB types, which is said to reduce fuel requirements to a minimum, with high compression making possible complete, smooth, smokeless combustion with a wide range of fuels.

Another feature is that timed injection takes place by means of individual pumps, one for each cylinder. Improved performance is also declared to be assured through a new cylinder head design, with large water jackets, giving a maximum and uniform cooling effect, are fitted with easily accessible clean-out openings.

Non-Clogging Pumps In New Worthington Line

Open Impeller Non-Clogging Centrifugal Pumps for handling solid materials in suspension, gritty liquids, liquids containing stringy material, etc., are now being made in a wide range of sizes by the Worthington Pump and Machinery Corporation, Harrison, New Jersey. The pumps are declared to be of rigid "Monobloc" construction, convenient, dependable, and low in first cost. They are compact, overall length of largest size only 23 inches. A

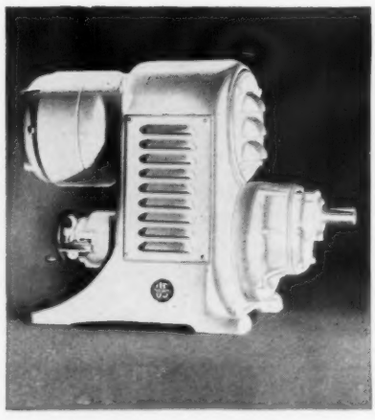


Non-clogging pump.

shaft of large size, extra-heavy-duty grease-lubricated ball bearings, rugged casings, stuffing box of ample depth, water thrower ring, splash-proof motor, fan and protecting apron on motor—are details of these units. Ratings range from 10 to 250 g.p.m. against heads of 10 to 100 feet; ½ hp. to 7½ hp.; 1500 revolutions per minute to 3600 revolutions per minute; AC or DC; 50 and 60-cycle; single-phase or polyphase.

Upright Design of Gear Motor Saves Space

The U. S. Electrical Mfg. Co. is now offering its U.S. Valvidrive in upright design. This is said to effect a saving in



Upright design of gear motor.

lateral space. The user is given the option of having the take-off shaft at either the high or low position.

MANUFACTURERS' PUBLICATIONS

Compressors. 8 p. (Bulletin L-611-B4A. Worthington Pump and Machinery Corp., Harrison, N. J.) Describes and illustrates tapered roller bearings and Feather Valve equipment. Also 4 p. bulletin (W-321-B7) describing Open Impeller Centrifugal Pumps.

Air Lift Pumping System. 24 p. (Bulletin 9042, Ingersoll-Rand Co., Phillipsburg, N. J.) Describes and illustrates Ingersoll-Rand method of air lift pumping of water, oil or other fluids.

Diesel Engines. 6 p. (Folder bulletin SP-137, Hercules Motors Corporation, Canton, O.) Describes and illustrates new DJX series of Diesel engines.

Tractors. 4 p. (Folder No. 729, Cleveland Tractor Co., Cleveland, O.) Ten models of Cletrac, containing new features described and illustrated.

Hose Masks. 8 p. (Bulletin EB-1, Mine Safety Appliances Co., Pittsburgh, Pa.) Descriptive of five different models of hose masks and equipment.

Link-Belt Speed Reducers, 32 p. (Catalog No. 1519, Link-Belt Co., 2045 West Hunting Park Ave., Philadelphia, Pa.) Describes its line of single, double and triple reduction Herringbone-Gear Speed Reducers for large speed ratios, and heavy and shock loads.

Raybestos-Manhattan Catalog. Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., has a second edition of catalog, covering belting, hose, packing, molded goods, friction material, rubber coverings, abrasive wheels, etc. Copies available on request. New bulletins also available covering Condor Compensated, the low-tension rubber belt, Condor Whipcord V-Belts, and Condor Whipcord Endless Transmission Belts.

CP Diesel Engines, Type RHB. 16 p. (Bulletin No. 779, Chicago Pneumatic Tool Co., 6 East 44th St., New York, N.Y.) Describes and illustrates line of new CP Diesel engines.

The Repair of Damaged Cast Iron Machinery. 8 p. (The Linde Air Products Co., 30 E. 42d St., New York, N. Y.) A consolidation of known facts regarding the repair of damaged cast-iron machinery by the oxy-acetylene process, discussing the respective merits of bronze-welding and fusion-welding; how the composition, the physical properties and intended use of casting, respectively influence heat-control methods.

Johns-Manville Industrial Friction Materials. (FM-4A, Johns-Manville, 22 E. 40th St., New York, N. Y.) A new brochure-catalog of J-M industrial friction materials of both flexible and rigid styles, containing brief descriptions, illustrations and tables.

A New Application of the RITEX Process to the Manufacture of Chrome Brick. (General Refractories Co., 106 S. 16th St., Philadelphia, Pa.)

Combined Engine and Compressor. 4 p. (Form 110-5M-6-35, The Cooper-Bessemer Corp., Mount Vernon, O., and Grove City, Pa.) Describes and illustrates the Type GX3A combined engine and compressor manufactured by this company.

Ruths Accumulators. 8 p. (Bulletin RA-35-5, Foster Wheeler Corp., 165 Broadway, New York, N. Y.) Describes and illustrates Ruths steam storage systems, including charts and diagrams.

Goetze Gaskets. 64 p. (Catalog 48, Goetze Gasket & Packing Co., Inc., New Brunswick, N. J.) Describes and illustrates metallic and semi-metallic gaskets, sheet and stuffing-box packings, sealing compounds, gasket cutting tools, valve disks, filter screens and metal stampings, including blue-print diagrams, size and price data.

Koehring Heavy Duty Construction Mixers. 12 p. (Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis.) Describes and illustrates the newly-designed Koehring heavy-duty construction mixers, sizes 28-S, 56-S and 84-S.

Lincoln "Shield Arc" Welder. (Bulletins No. 309 and 310, Lincoln Electric Co., Cleveland, O.) Two 4-page folders, describing and illustrating engine-driven models SA-200 Type S-3676, and SA-300 Type 3677.

Automatic Arc Welding by the Electronic Tornado. 42 p. (Lincoln Electric Co., Cleveland, O.) Explains and illustrates the "Electronic Tornado" system of automatic carbon arc welding, including line drawings and illustrations of typical automatic arc-welding applications.

Series 400 Self-Aligning Roller Bearing Units. 12 p. (Book No. 1494, Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.) Describes and illustrates the new "series 400" line of anti-friction bearing units, equipped with Shafer double-row roller bearings.

Pioneer Conveyors. 16 p. (Form No. 504, Pioneer Gravel Equipment Mfg. Co., 1515 Central Ave., Minneapolis, Minn.) Describes and illustrates this company's line of conveyors and conveyor parts.

Raymond Bowl Mill. 8 p. (Raymond Bros. Impact Pulverizer Co., 1315 N. Branch St., Chicago, Ill.) Describes and illustrates an original and advanced type of pulverizer that offers new advantages in fine grinding.

Speed Control Handbook. 112 p. (Reeves Pulley Co., Columbus, Ind.) Contains up-to-date, authoritative information on modern methods of variable-speed control for industrial machines, with illustrations of specific applications in many major industries; a complete reference work on adjustable speed control.

Worthington Compressors. 8 p. (Bulletin L-611-B5A, Worthington Pump & Machinery Corp., Harrison, N. J.) Describes and illustrates single horizontal, single-stage, steam- and motor-driven compressors manufactured by this company.

Lawrence Standard Dredging Pumps. 4 p. (Bulletin 208, Lawrence Machine & Pump Corp., 371 Market St., Lawrence, Mass.) Describes and illustrates this company's standard dredging pumps for total heads up to 100 ft.

Type AA Reliance Induction Motors. (Reliance Electric & Engrg. Co., Ivanhoe Road, Cleveland, Ohio.) Bulletins 118 and 119 (4 p. each), describing and illustrating this company's Type AA induction motors with squirrel-cage frames 202-405 and 444-585.

Cummins Engine Co. Names Atlantic Coast Manager

Announcement has just been made of the appointment of C. D. Cummins as Atlantic Coast Manager for the Cummins Engine Company of Columbus, Indiana. Mr. Cummins is located in New York and is in constant contact with all of the Cummins distributors along the Atlantic Coast, which has been of great aid to both the distributors and the distributors' customers. Both sales and service problems come under his jurisdiction in that territory and the Cummins Engine Company is thus able to render their engine users both immediate and highly competent service on any problem.

H. Y. Smith Co. Move Milwaukee Headquarters

H. Y. Smith Company, on December 4, moved their Milwaukee offices into larger and more conveniently located quarters in Suite 201, Underwriters Exchange Building, 828 North Broadway. The telephone number, Daly 3830, remains unchanged.

BOOKS *you* should have

Your library is incomplete without the books listed below — books of real and practical value to all producers of non-metallic minerals.

Prices are shown on the order blank below. Check the books you want, detach the order blank (only) and send it to us with your remittance.

For books on subjects not listed below, write our book department.

Pit and Quarry Handbook with which is consolidated the Directory of Cement, Gypsum, Lime, Sand, Gravel and Crushed-Stone Plants. Published Annually. A complete, concise and conveniently-arranged technical reference work, on prospecting, plant design and all phases of operation and maintenance of non-metallic mineral producing and manufacturing plants. Accepted universally as the standard authority.

The Directory. Alphabetical and geographical lists of all non-metallic mineral plants in the United States and Canada, conveniently keyed for product.

Pit and Quarry Directory. The Directory section of the Handbook, published separately.

Cements, Limes and Plasters. By Edwin C. Eckel, C.E., Consulting Geologist. Third edition; 699 pages 6x9; 161 figures; 269 tables; cloth. A complete and comprehensive review of the raw materials, methods of manufacture and properties of the finished product, of all kinds of cementing materials used for construction.

Portland Cement. By Richard K. Meade. Third edition; revised and enlarged; XII+707 pages, illustrated. The composition, raw materials, manufacture, testing and analysis in the Portland cement industry.

Non-Metallic Minerals. By Raymond B. Ladoo. 686 pages 6x9; 50 diagrams. A comprehensive book on the composition and properties, methods of mining and preparation, market values, extent and nature of markets, specifications and tests and uses of all non-metallic minerals of commercial importance, except fuels and natural bitumens and hydrocarbons.

Mechanical Engineers' Handbook. Lionel S. Marks, editor-in-chief, Professor of Mechanical Engineering, Harvard University; assisted by a staff of 75 specialists. 2264 pages 4½x7; over 1300 illustrations and diagrams; flexible; thumb-indexed. Thoroughly revised in all parts; up to date in both practice and theory. The sections have been subdivided more thoroughly to give more specific treatment to various branches of mechanical engineering. Standards and practice have been brought up to 1930; physical data have been everywhere revised to incorporate the best current values.

Mining Engineers' Handbook. Compiled by a staff of specialists; Robert Peele, editor-in-chief, E.M., Consulting Mining-Engineer, formerly professor of Mining in the School of Mines, Columbia University. Second edition. For engineers concerned with the development and management of mines, and also for those interested in the construction details involved in the installation of plants. Covers mining and metallurgy, and allied subjects necessary to the mining engineer, and such data on machinery, power plants, electric transmission and structural design as he may need in the field.

A 2-volume edition is published, for greater facility in field use.

Mineral Deposits. By Waldemar Lindgren, Professor of Economic Geology, Massachusetts Institute of Technology. Third edition; 1049 pages 6x9; 313 illustrations. A description, by classes and type examples, of the occurrence, structure and origin of the principal deposits.

Diesel Engines. By Lacey H. Morrison. 598 pages 6x9; 385 illustrations. The book describes the various forms of Diesel engines now available, explains their construction and operation, tells how to keep them running in good condition and how to install them. Actual operation costs of Diesel engines now in use in various industries are included.

The Stone Industries. By Oliver Bowles, Supervising Engineer, Building Materials Section, United States Bureau of Mines. Covering the building-, decorative-, and crushed-stone industries in all their ramifications. It describes rocks and covers the geology and distribution of developed deposits in every state. It embraces the qualities of stones, their uses, methods of quarrying and manufacture, and marketing. Chapters are devoted to limestone, sandstone, granite, marble, slate, soapstone and foreign building and ornamental stones.

Excavation Machinery, Methods and Costs. By A. B. McDaniel, Principal Engineer, Construction Division of the Army. 530 pages 6x9; illustrated. Contents: Tools for loosening and hand excavation; drag and wheel scrapers; blade or road graders; elevating graders; capstan plows; power shovels; scraper, templet, trench, and wheel excavators; cableways; dipper, ladder and hydraulic dredges; subaqueous rock drills; car and wagon loaders; highway and railroad construction; reclamation work; rivers, harbors and canals; municipal improvements; quarries, open-cut mines, gravel pits and brick yards; tunnels and underground mines.

Diesel Engineering Handbook. Edited by L. H. Morrison, editor of **Diesel Power.** Contains more than 800 pages of text devoted to the history of the development of the Diesel engine, and including descriptive matter concerning the many models now on the market. It is designed for engine builders, consulting and operating engineers, designers, prospective Diesel users, banks and investment houses. Profusely illustrated.

The Properties of Silica. By Robert B. Sosman. A monograph on silica in its various phases and transformations, discussing its structure and symmetry, its thermal and mechanical energy, its electric and magnetic properties, and its uses and applications in industry. 856 pages.

Bearing Metals and Bearings. By W. M. Corse. A survey of the fundamental principles and practices involved in the selection of bearings and bearing metals, together with a bibliography of reference literature from 1900-1928 inclusive. Illustrated. 383 pages.

Industrial Filtration. By Arthur Wright. It puts on record the author's twelve years of filter experience, and every effort has been made to make the information of practical value. Illustrated. 336 pages.

CONTENTS: Clarification; Cake building; Cake washing; Cake drying; Cake discharging; Filter media; Theory of filter application; Auxiliary equipment; Theory and mechanics as related to practice; Bag filters; Plate and frame presses; Suction leaf filters; Pressure leaf filters; The Kelly filter; the Sweetland filter, the Vallez filter; Rotary vacuum filters; Oliver filter, American continuous filter; FEinc apparatus; Special filters and clarifiers. Door apparatus, Merrill filter, Atkins-Shriver press, Burt filter, Zenith rotary hopper dewaterer, Oliver rotary sand table, FEinc acid sand filter; Application of different types of filters; Relation of filtration to other plant operations, drying, evaporation, etc., combination filtering and drying; Plant practice; Index.

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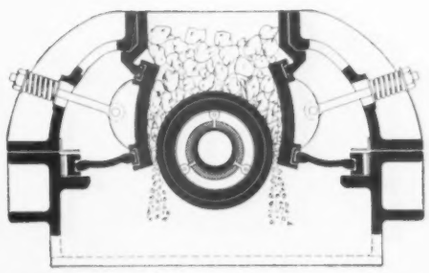

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Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.

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Abrasion Resisting Steel
Ryerson & Son, Joseph T.

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*Eagle Iron Works

Agitators, Thickeners and Slurry Mixers
*Hardinge Co.
*Traylor Engr. & Mfg. Co.

Air Compressors (Portable)
*Traylor Engr. & Mfg. Co.

Air Compressors (Stationary)
*Traylor Engr. & Mfg. Co.

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Sprout, Waldron & Co.

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*Harnischfeger Corp.
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*Gruendler Crusher & Pulverizer Co.
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Lewistown Foundry & Machinery Co.
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*Traylor Engr. & Mfg. Co.

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*American Pulverizer Co.

Crushers (Roll)
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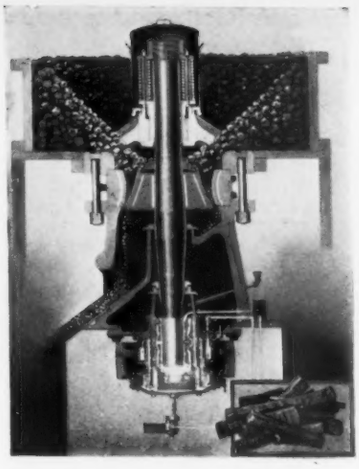

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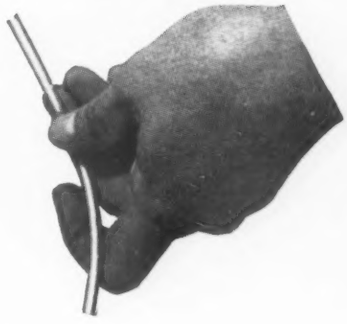

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4. **Better fragmentation** because the Cordeau hook-up can be planned to fire each hole in rotation. **The time interval is infinitesimal,** yet it serves to **relieve burden.**

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Send for a copy of the Cordeau Book.
There is no charge.

CORDEAU DETONATING FUSE BICKFORD

ALSO SAFETY FUSE *Since* 1836

THE ENSIGN-BICKFORD COMPANY

SIMSBURY, CONNECTICUT

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Index to Advertisers on Page 64

Crushers (Rotary)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
Bonnot Co.
New Holland Machine Co.

Crushing Rolls
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
*Traylor Engr. & Mfg. Co.

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Doors (Iron)
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Dragline Cableway Excavators
*Link-Belt Co.
*Sauerman Bros. Inc.

Dragline Excavators
*Harnischfeger Corp.
*Lima Locomotive Works, Inc.
*Link-Belt Co.

Dredges
Hetherington & Berner, Inc.
*Morris Machine Works

Drilling Contractors
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Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Core)
Hoffman Bros. Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Diamond)
Hoffman Bros. Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Rock)
*Jeffrey Mfg. Co.

Drills (Well) (See Drills—Blast-Hole)

Drives (Multiple, Belt, Chain, Rope)
*Allis-Chalmers Mfg. Co.

Dryers
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdry. & Mch. Co.
McLanahan and Stone Corp.
*Traylor Engr. & Mfg. Co.

Dust Arresters
Dracco Corp.
*Parsons Engr. Corp.

Dust-Collecting Systems
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Dracco Corp.
*Parsons Engr. Corp.
Raymond Bros. Impact Pulv. Co.

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*Allen-Sherman-Hoff Co.
Dracco Corp.
*Parsons Engr. Corp.

Dust Handling Systems (Hydro Vacuum)
*Allen-Sherman-Hoff Co.

Dynamite (See Explosives)

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*Allis-Chalmers Mfg. Co.

Elevator Belting (See Belting)

Elevators (See Conveyors and Elevators)
chine Co.

Eliminators (Soft Stone) (See Soft Stone Eliminators)

Engineers
*Allis-Chalmers Mfg. Co.
Bonnot Co.
Cross Engr. Co.
Hetherington & Berner, Inc.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

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Engines (Diesel)
Cummins Engine Co.
Nordberg Mfg. Co.

Engines (Internal-Combustion)
Cummins Engine Co.
Nordberg Mfg. Co.

Engines (Steam)
*Morris Machine Works
Nordberg Mfg. Co.

Excavating Machinery (See Shovels; Cranes; Buckets, etc.)

Excavators—Shallow Grading (Bucket Elevator Type)
Haiss Mfg. Co., Geo.

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*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Feeders
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Fencing (Woven Wire)
*American Steel & Wire Co.
Smith Wire & Iron Works, F. P.

Fire Escapes
Smith Wire & Iron Works, F. P.

Floor Sweeping Systems (Hydro Vacuum)
*Allen-Sherman-Hoff Co.

Fuses (Detonating)
*Ensign-Bickford Co.

Gaskets
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Gasoline Engines (See Engines—Internal-Combustion)

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Gates (Clamshell)
Haiss Mfg. Co., Geo.
*Link-Belt Co.

Gears (Herringbone)
*Jeffrey Mfg. Co.
*Link-Belt Co.
Sprout, Waldron & Co.

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Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Sprout, Waldron & Co.

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Goggle Parts
Goggle Parts Co.

Goggles
Goggle Parts Co.

Grab Buckets (See Buckets—Clamshell, Orange - Peel, etc.)

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*Hendrick Mfg. Co.
Ryerson & Son, Joseph T.

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Grizzlies
*Allis-Chalmers Mfg. Co.
*Eagle Iron Works
*Hendrick Mfg. Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mach. Co.
Manganese Steel Forge Co.
*Robins Conveying Belt Co.
Smith Engr. Works
*Traylor Engr. & Mfg. Co.

Guards (Machine)
Goggle Parts Co.

Guards (Wire)
Manganese Steel Forge Co.
Smith Wire & Iron Works, F. P.

Guns (Hydraulic)
Hetherington & Berner, Inc.
Taylor Forge & Pipe Works

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Hoists
*Harnischfeger Corp.
Hetherington & Berner, Inc.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
*Sauerman Bros., Inc.
Smith Engr. Works
Sprout, Waldron & Co.

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*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.

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Republic Rubber Co.

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Goodyear Tire & Rubber Co.
Republic Rubber Co.

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Idlers
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Kilns and Coolers (Rotary)
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Traylor Engr. & Mfg. Co.

Kilns (Vertical)
*Hardinge Co.

Lenses (Goggle)
Goggle Parts Co.

Lime-Handling Equipment
*Hardinge Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Raymond Bros. Impact Pulv. Co.
*Robins Conveying Belt Co.

Lime and Hydrating Plants
*Hardinge Co.

Lime Kilns
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Linings (Ball- and Tube-Mill) (See Mill Liners and Linings)

Loaders and Unloaders
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Locomotives (Electric, Gas and Steam)
*Lima Locomotive Works

Locomotives (Trolley-Battery)
*Jeffrey Mfg. Co.

Magnetic Pulleys (See Pulleys, Magnetic)

Manganese Steel
Manganese Steel Forge Co.
Ryerson & Son, Joseph T.

Manganese Steel (Plates and Sheets)
Manganese Steel Forge Co.
Ryerson & Son, Joseph T.

Mechanical Rubber Goods
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Mill Liners and Linings
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Mills (Grinding) (See also Crushers—Hammer)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
Bonnot Co.
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mch. Co.
Raymond Bros. Impact Pulv. Co.
Sprout, Waldron & Co.
*Traylor Engr. & Mfg. Co.

Motors and Generators
*Allis-Chalmers Mfg. Co.
*Harnischfeger Corp.

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Nails
*American Steel & Wire Co.
Ryerson & Son, Joseph T.

Netting (Locomotive Stack)
Smith Wire & Iron Works, F. P.

Nozzles (Gravel Washing)
*Deister Concentrator Co.

Nozzles (Hydraulic) (See Guns—Hydraulic)

Nozzles (Spray)
*Deister Concentrator Co.

Packings
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Partitions (Wire)
Smith Wire & Iron Works, F. P.

Paving Mixers
Jaeger Machine Co.

Perforated Metal Plates
*Allis-Chalmers Mfg. Co.
Chicago Perforating Co.
Cross Engr. Co.
*Hendrick Mfg. Co.
Ryerson & Son, Joseph T.
Sprout, Waldron & Co.

Pipe, Dredge (Floating and Shore)
Taylor Forge & Pipe Works

Pipe Flanges
Hetherington & Berner, Inc.
Ryerson & Son, Joseph T.
Taylor Forge & Pipe Works

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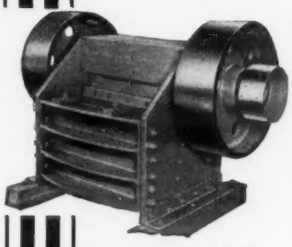
Portable Conveyors
Haiss Mfg. Co., Geo.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

*** See also information in the 1935 Pit and Quarry HANDBOOK.**

GRUENDLER EQUIPMENT

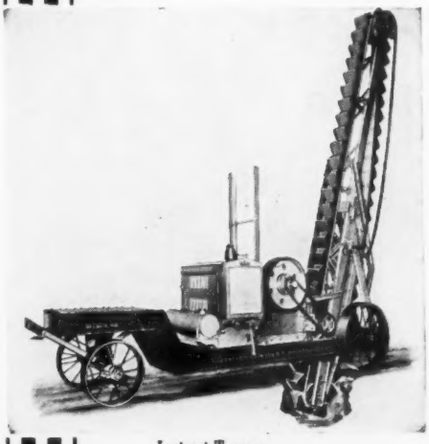


Roller Bearing Jaw Crusher

is backed by half a century's successful experience in designing machinery for crushing, screening and material handling by the most advanced methods. To save horsepower, to reduce maintenance, to produce more uniform materials, specify Gruendler Equipment.

CRUSHERS

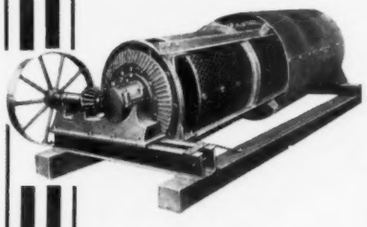
Roller Bearing Jaw Crushers for primary, secondary and fine reduction. In all capacities for all sizes of aggregates. Remarkable economies in power and lubrication.



Latest Type Portable

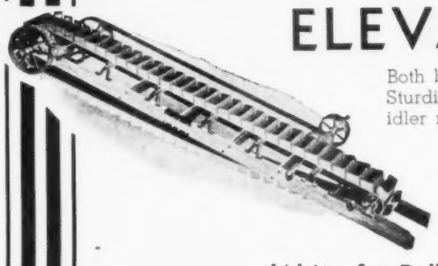
UNIT PLANTS

Portable, semi-portable and stationary units for crushing, screening and conveying in capacities from 100 to 4000 tons daily. One reduction operations.



SCREENS

Revolving type heavy-duty Screens for giving maximum continuous capacity. Extra heavy roller bearings for long life and low power requirements. Standard sizes with perforated plates or wire cloth.



ELEVATORS

Both belt and chain types. Sturdily built with steel idler rollers and one-piece malleable steel buckets. Designed for all applications with full range of capacities.

Write for Bulletins

GRUENDLER CRUSHER & PULVERIZER CO.

2915 N. Market St. St. Louis, Mo.

They Get the JOBS

..that's why JAEGER TRUCK MIXERS Outsell All Others

Because they offer every facility for the faster delivery of better concrete ("Dual-Mix" action, 1-man chute, dual controls, rapid accurate water tank and patented discharge) Jaeger Truck Mixers get most of the jobs, serve them at lowest cost, and continue to outsell all other makes. Sizes 1 to 5 cubic yards.

Write for details, prices.

1-Man Spout Saves Minutes on Every Trip.

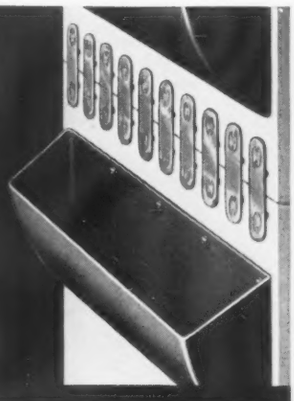
THE JAEGER MACHINE CO. 602 Dublin Ave., Columbus, Ohio

FLEXCO HD

TRADE MARK

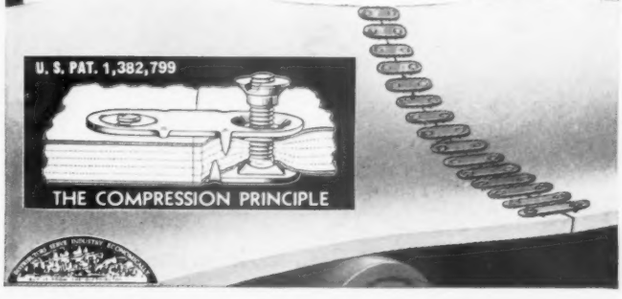
Reg. U. S. Pat. Off.

BELT FASTENERS *for* ELEVATORS *and* CONVEYORS



COMPRESSION develops the tremendous strength of the FLEXCO HD joint. The recessed plates and teeth embed in the belt, producing a smooth, powerful, tight butt joint of balanced pull. Plies cannot work against each other and separate in belt ends. Remarkable service records are developed by these fasteners and thousands of plants use nothing else. Made of steel or Monel Metal. Templates, wrenches and punches supplied to facilitate application. Sold by jobbers and belting houses in five sizes. Consulting service given gladly regarding any belt joining.

FLEXIBLE STEEL LACING COMPANY
4623 Lexington Street, Chicago
In England at 133 Finsbury Pavement, London, E. C. 2



Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

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*American Steel & Wire Co.

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Sprout, Waldron & Co.

Pulleys (Wing)
Sprout, Waldron & Co.

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*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulv. Co.

Pulverizers (See also Crushers; Mills; etc.)
*American Pulverizer Co.
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*Gruendler Crusher & Pulverizer Co.
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
New Holland Machine Co.
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*Traylor Engr. & Mfg. Co.

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*Allen-Sherman-Hoff Co.
*Morris Machine Works

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*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works

Pumps (Dredging)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
*Morris Machine Works

Pumps (Sand and Gravel)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works

Respirator Parts
Goggle Parts Co.

Respirators
Goggle Parts Co.

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*Traylor Engr. & Mfg. Co.

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Ryerson & Son, Joseph T.

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*Link-Belt Co.
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*Jeffrey Mfg. Co.
*Link-Belt Co.
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*Link-Belt Co.
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Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Cross Engr. Co.
*Deister Concentrator Co.
*Deister Machine Co.
*Eagle Iron Works
*Gruendler Crusher & Pulverizer Co.
Haiss Mfg. Co., Geo.
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Lewistown Foundry & Machinery Co.
*Link-Belt Co.
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McLanahan and Stone Corp.
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*Productive Equip. Corp.
*Robins Conveying Belt Co.
*Roebling's Sons Co., John A.
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Smith Wire & Iron Works, F. P.
Sprout, Waldron & Co.
*Traylor Engr. & Mfg. Co.

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*Allis-Chalmers Mfg. Co.
*Deister Concentrator Co.
*Deister Machine Co.
*Gruendler Crusher & Pulverizer Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
Nordberg Mfg. Co.
*Productive Equip. Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

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*Allis-Chalmers Mfg. Co.
*Eagle Iron Works
*Gruendler Crusher & Pulverizer Co.
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*Link-Belt Co.
*Jeffrey Mfg. Co.
McLanahan and Stone Corp.
Sprout, Waldron & Co.

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*Harnischfeger Corp.
*Lima Locomotive Works, Inc.
*Link-Belt Co.

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*Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

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Iowa Mfg. Co.
*Link-Belt Co.

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*Deister Concentrator Co.

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Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Sprout, Waldron & Co.

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*Jeffrey Mfg. Co.

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Stairs (Mine)
Smith Wire & Iron Works, F. P.

Steel (Alloy)
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Ryerson & Son, Joseph T.

Steel (Bars, Shapes, Plates, etc.)
Ryerson & Son, Joseph T.

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*Hendrick Mfg. Co.
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Sprout, Waldron & Co.

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*Jeffrey Mfg. Co.
*Link-Belt Co.
*Sauerman Bros., Inc.

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Goggle Parts Co.

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*Allen-Sherman-Hoff Co.

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*Hendrick Mfg. Co.
*Link-Belt Co.

Tanks (Sand-Settling)
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Smith Engr. Works

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*Hendrick Mfg. Co.

Thickeners (Slurry)
*Hardinge Co.

Tire Repair Materials
Goodyear Tire & Rubber Co.

Tires (Passenger Car, Tractor and Truck)
Goodyear Tire & Rubber Co.

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Track Shifters
Nordberg Mfg. Co.

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*Allis-Chalmers Mfg. Co.

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*American Steel & Wire Co.
*Roebling's Sons Co., John A.

Transformers
*Allis-Chalmers Mfg. Co.

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Transmission Machinery
*Allis-Chalmers Mfg. Co.
*Gruendler Crusher & Pulverizer Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.

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*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

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Goodyear Tire & Rubber Co.

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*Allis-Chalmers Mfg. Co.

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*Jeffrey Mfg. Co.
*Link-Belt Co.

Valves (Pump)
Taylor Forge & Pipe Works

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*Link-Belt Co.

Vibrating Screen Plate
Chicago Perforating Co.
Cross Engr. Co.
*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
Morrow Mfg. Co.

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*Allis-Chalmers Mfg. Co.
*Eagle Iron Works
Haiss Mfg. Co., Geo.
*Hardinge Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Smith Engr. Works
*Traylor Engr. & Mfg. Co.

Welding & Cutting Equipment
Ryerson & Son, Joseph T.

Welding Helmets and Shields
Goggle Parts Co.

Welding Supplies
*American Steel & Wire Co.
Manganese Steel Forge Co.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.

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*Eagle Iron Works
Iowa Mfg. Co.

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Winches and Capstans
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Wire & Cable (Electric)
*American Steel & Wire Co.
*Roebling's Sons Co., John A.

Wire Cloth
Audubon Wire Cloth Corp.
Cleveland Wire Cloth & Mfg. Co.
Manganese Steel Forge Co.
*Robbins Conveying Belt Co.
*Roebling's Sons Co., John A.
Smith Wire & Iron Works, F. P.

Wire Rope
American Cable Co.
*American Steel & Wire Co.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.
Williamsport Wire Rope Co.

Wire Rope Fittings
American Cable Co.
*American Steel & Wire Co.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.
Williamsport Wire Rope Co.

Wire Rope Slings
American Cable Co.
*American Steel & Wire Co.
*Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

Wire (Welding)
*American Steel & Wire Co.
Manganese Steel Forge Co.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.

Worm Gears (See Gears and Pinions)

*** See also information in the 1935 Pit and Quarry HANDBOOK.**

Better Screening

FOR exact and careful screening of fine and coarse materials at low cost. Gives uniform vibration — no "dead" areas.

It is truly "A triumph of mechanical vibration." Send for catalog No. 1462.

LINK-BELT COMPANY

PHILADELPHIA ATLANTA CHICAGO SAN FRANCISCO INDIANAPOLIS TORONTO

Offices in Principal Cities

5365

LINK-BELT VIBRATING SCREEN

Modern, All Welded Construction has cut off extra weight . . . provided greater strength to take all stresses without faltering. Insures proper permanent alignment of all working parts; lower upkeep expense. High grade alloy steels reduce weight still further. First reduction helical gears, heat-treated and double cut, operate in an oil bath. Anti-friction bearings are used at all vital points. The center of gravity is low with main machinery units mounted behind center pin to eliminate dead counterweight. The light welded tube boom is strong, easier to handle; makes it practical to convert right on the job. Bulletin No. 100 has complete details. A post card will bring your copy.

HOW THE BANTAM WEIGHT MEASURES UP:

Capacity	⅜-yard
Engine	Ford V-8 (40 HP)
Weight (as shovel)	12,800 lbs.
Crowding Motion	P&H Rapid Reversing
Swing Clutches	Split Second Control
Hoist Line Speed	Internal Expanding
Dragline Speed	156 F.P.M.
Swing Speed	5 RPM
Travel Speed	1½ to 3 MPH
Tail Swing	7 Feet 4 inches
Height to Top of Cab	10 Feet

HARNISCHFEGER CORPORATION
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4451 W. National Avenue, Milwaukee, Wis.

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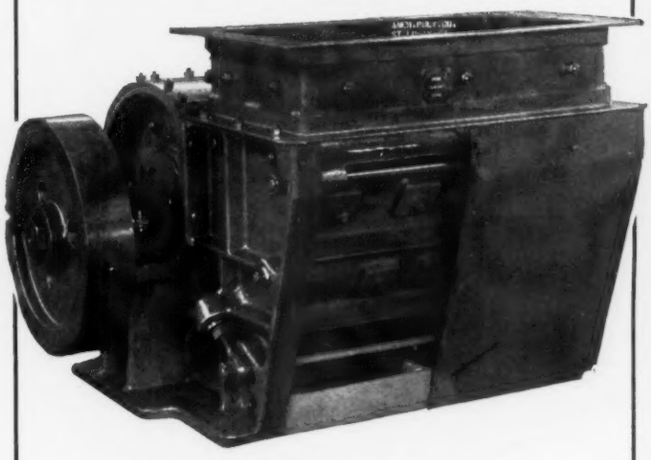
AMERICAN HAMMER MILL



Front View Showing Breaker Plate Adjustment

LOW FIRST COST makes the AMERICAN mill a prime investment. It is easy to install, dismantle and move.

LOWER OPERATING COST because the AMERICAN has manganese steel grinding parts, alloy steel shaft and SKF spherical roller bearings, thus assuring LOW MAINTENANCE COST. This mill makes a more uniform product with minimum fines and no slivers or chips.

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OVAL BAG DUST ARRESTORS ✦ BLAST ROOMS ✦ OSCILLATING BLAST BARRELS

PARSONS
PARSONS ENGINEERING CORPORATION
CLEVELAND

Parsons Oval Bag Dust Arrestors combine the advantages of the screen and cylinder types.

Write for Bulletin DA-5.

PARSONS ENGINEERING CORPORATION
Cleveland Ohio

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TRU-LAY *Preformed* BREAKS THE RECORD

. . . . moves more tons with less rope cost

• TRU-LAY *Pre*formed Wire Rope breaks the performance record of *non*-preformed ropes. At one operation after another it is reducing wire rope costs. Reducing idle time while ropes are being replaced. Making sheaves and drums last longer. Making faster, steadier production possible. Write for full information.

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CRUSHERS—Double roll and Sledge Wedge Crushers, for practically any product. Capacities to 1000 tons an hour.

SUPER DRY PANS—For especially large tonnages.

WASHERS AND SCRUBBERS—Steel log Washers; scrubbers, cylinder washers, sand drags and washing screens.

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- ☐ Belting, conveyor and elevator
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- ☐ Belt lacing
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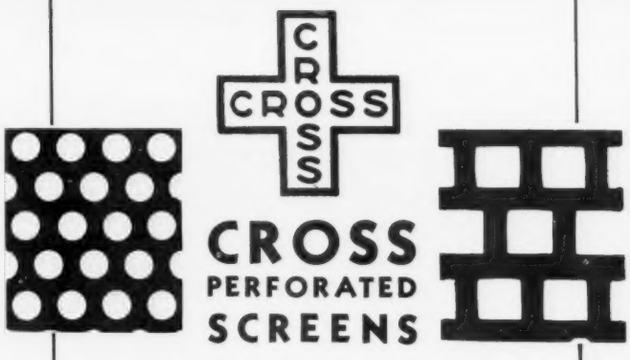

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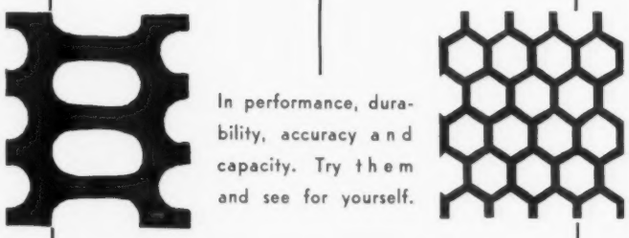

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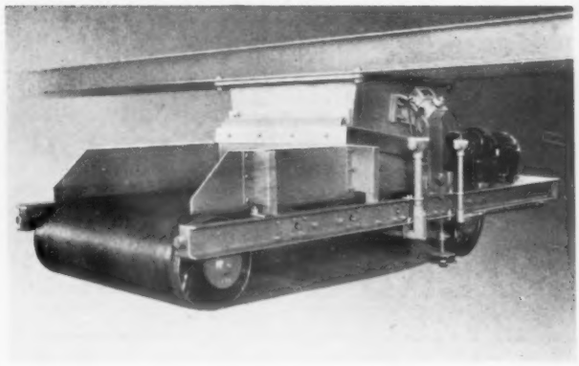

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This simple, accurate, low cost Feeder will correct many present ills of grinding, drying and mixing operations. Tell us the type of Feeder you are now using —We will tell you what improvement you can expect with the Hardinge Constant Weight Feeder. Write for Bulletin 33C.

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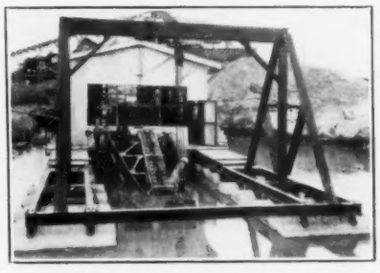
EAGLE SWINTEK SCREEN NOZZLE LADDER LOWER YOUR COST



Will eliminate stoppages and slug pumping—insuring an even, constant feed of solids to the suction nozzle —with less power—greatly decreasing the cost per yard of material produced

Write for descriptive literature and let us tell you how this can be done with your dredge.

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FEBRUARY 25, 26, 27, 28, 1936

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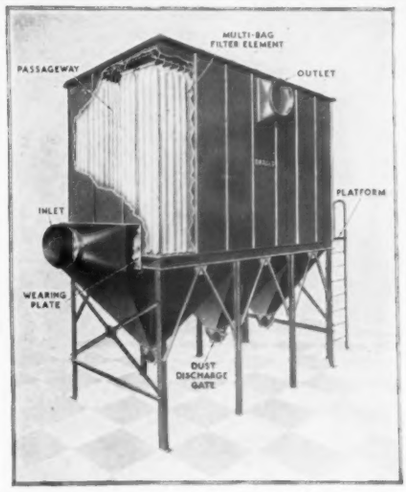

Our Engineers developed the DRACCO MULTI-BAG FILTER to supply the demand for a LOW COST, EFFICIENT FILTER. It contains many tried and tested features of construction that contributes to HIGH dust collecting efficiency and LOW operating and maintenance costs. It was especially designed to meet the needs of your field. Why not have our Engineers check over the DUST condition in your Plant? Your DUST costs you money. We can CONTROL it.

CONTROLLED DUST REDUCE COSTS

DRACCO Filters will reflect a savings in,—(1) increased efficiency of operation; (2) longer life and less maintenance of equipment; (3) health of workers; (4) fewer lawsuits. Because of these savings, why not investigate and find out what DRACCO Filters will do for you?

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Operating spans: 100 to 1500 ft. Write for Catalog.

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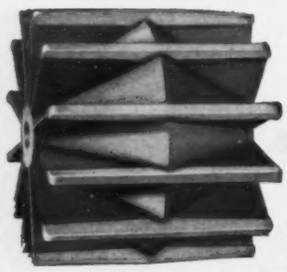

Interchangeable with standard pulleys. Nothing can lodge between belt and pulley.

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Elevating, Conveying and Transmission Equipment

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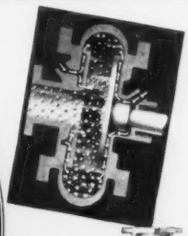

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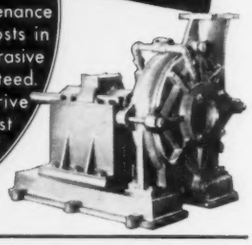

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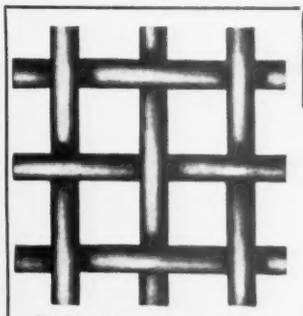

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DURO SCREENS
Cost Less Per Job

We have developed a special SPRING STEEL Wire Cloth that is showing sensational endurance records in screening hard materials. Read about it in our new Bulletin just published—there's proof in performance. Specify DURO for your screen equipment.

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Lewistown Foundry Products
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BUCKET ELEVATORS
REVOLVING SCREENS
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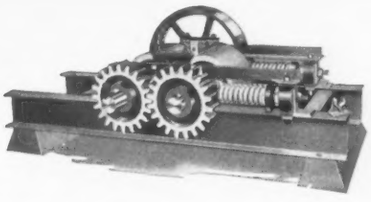

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Heavy-Duty (Ball-Bearing) *Sand and Gravel*

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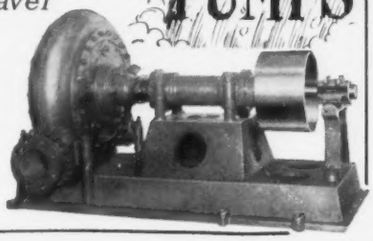
High efficiency — low operating cost—precision workmanship — wear-resisting, non-heating bearings even when operated under extremely high heads. WRITE



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15 ton Industrial Caterpillar Crane.
1½ yd. Cap. 60 ft. Span Bucket, O E T Crane.
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Champion 1030 & 1040 Roller Bearing Jaw Crushers.
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Allis Chalmers 48x36 Jaw Crusher.
3 ft., 5½ ft., 7 ft. Symons Cone Crushers.
Traylor 4—10TZ Reduction Crushers.
18 in. and 24 in. Symons Disc Crushers.
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6 ft. by 8 ft. Traylor, Tube Mill.
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10 in. & 36 in. Superior McCully Crushers.

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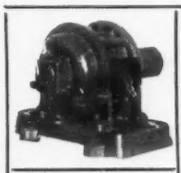

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250	F. M. sl. rg.	1200
200	West. sl. rg.	900
200	G. E. sl. rg.	900
150	G. E. sl. rg.	1750
150	West. sl. rg.	720
100	G. E. sl. rg.	570
100	West. sl. rg.	1160
75	G. E. sl. rg.	1200
60	G. E. sl. rg.	900

ENGINE GENER.
1—400 kva., Cr. Wh., 240 v., 3 ph., 60 cy., 120 r.p.m. to Hamilton Corliss Engine.

MOTOR GENER.
1—500 kw.G.E.D.C.Gen. 250/275 v. Comp'd, Interpole, 720 r.p.m., cpld. to 700 hp.G.E. type ATI, Syn. Motor, 2200/440 v., 3 ph. 60 cy., 720 r.p.m.

CENTRIF. PUMPS
3—14,000 G.P.M., 150' Head dir. conn., 675 hp. Al. Ch. 900 r.p.m. syn. motors.
1—14,000 G.P.M., 60' Hd., dir. conn. 260 hp., Al. Ch. 720 r.p.m.

Above are a few of our stock items.

BELYEA CO., INC.
153 W. 18TH ST., NEW YORK CITY
REBUILT GUARANTEED

FOR SALE OR RENT

Link Belt K-25 ¾ Yard Gas Crane.
General ½ Yard Gas Crane.
Mundy D.D. Hoist, 40 HP Elec. A.C.
Mundy D.D. Hoist, 15 HP Elec. A.C.
O & S D.D. Hoist, 40 HP Elec. A.C.
Two—75B Lorain Gas Cranes 50' Booms.
One—220' Metaweld Portable Compressor.
One—330' Metaweld Portable Compressor.
Will Sacrifice.

R. H. ROYER, P. O. Box 2, Upper Darby, Pa.

FOR SALE CHEAP

Slackline outfit—Consisting of 100-foot steel mast, 125 H. P. 2 speed hoist, 1½-yard Sauerman Bucket, etc. Write for particulars.

MIAMI GRAVEL COMPANY
Huntington, W. Va

FOR SALE

1—10" dredging pump.
1—48" rotary screen.
1—8" x 12" Universal Crusher.
1—18" Symons Disk Crusher.
1—Holt 60 cat. tractor 2000 ft. track.

Will buy 8" x 20" Wheeling jaw crusher.

E. T. BURNSIDE, SHELBYVILLE, IND.

BARGAINS

No. 4 Williams Jumbo Hammermill. Overhauled.
8 Ton Plymouth standard gauge Gas Locomotive.
Reduction Crushers—5½' Cone, No. 7 Newhouse, etc.
Jaw Crushers—9x16 & 10x20 port. Also 7x12 to 66x84.
Sauerman Drag Scraper Outfits, ½ to 6 yds.
Draglines—3W Monighan; Cl. 24 Diesel-Electric, etc.
Cement Block Machine & Plant, inc. power.
Cranes, Shovels, & Draglines—⅜, ½, ¾, and 1 yd.
Barber-Greene & Haiss Loaders, Screens, Elevators.

James Wood, 53 West Jackson Blvd., Chicago, Ill.

GOOD USED EQUIPMENT

SELECTED SPECIAL ITEMS

1—8'8"x85' Ruggles-Coles class A Rotary Dryer; also 5'x26' rebuilt at our shops.
4—Symons Cone Crushers, 2', 3', 4', 5½', 7'.
1—No. 1260 Jeffrey Badstad Jaw Crusher, 12x30" feed, 12x60" dia., to ½".
1—3 roll Raymond High Side Mill.
2—4 roll Raymond Low Side Mills.
5—Raymond Pulverizers, No. 0000,00, No. 1, 3.
1—12" Mikro Pulverizer with A. C. Motors.
1—21" Mikro Pulverizer with 40 H.P. 3 phase, 60 cycle, 440 or 550 volt D. C. Motor.
8—Hardinge Ball and Pebble Mills, 4½'x16", 6x22, 6x36, 7x36, 8x30.
1—6'x8' Patterson Ball Mill, silex, with air separator, A. C. Motors, etc.
1—7'6"x5' Patterson Pebble Mill, unlined.
1—3'x12' Hendy Tube Mill, iron lined.
6—5'x22', 6'x22' Gates iron lined Tube Mills.
2—6'6"x60' Vulcan Rotary Kilns.
1—7'x100' Vulcan Rotary Kiln.
3—8'x8' Oliver Rotary Vacuum Filters.
1—24x72" Magnetic Pulley, with m. g. set.
1—36"x36" Gruendler heavy duty Hammer Mill, ball bearings, No. 4-XC.
1—7"x24" Sturtevant Jaw Crusher, to ½".
2—20"x14", 36x16 Sturtevant Crushing Rolls.
6—3'x5', 4x5, 4x7 Tyler Hummer Screens.
2—Generator Sets for Tyler Screens—G1, G8.
2—4'x6', 5'x8' Niagara roller bearing Screens.
3—Rotex Screens, two No. 41, one No. 61.
1—8' Gayco Air Separator, No. 26.

SEND FOR BULLETIN OF

our regular stock of Crushers; Vibrating Screens; Ball, Rod and Tube Mills; Air Compressors; Rotary Kilns and Dryers; Hardinge Ball and Pebble Mills; Raymond and other Pulverizers; Air Classifiers; Thickeners; Wet Classifiers; Filter Presses; Continuous Filters, etc.

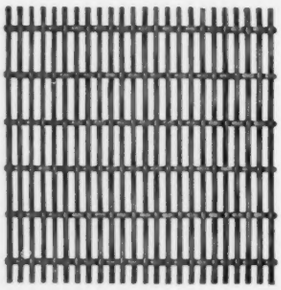
CONSOLIDATED PRODUCTS COMPANY, INC.
17-19 Park Row, New York, N. Y.
Shops and Yards at Newark, N. J., cover eight acres.

SAND LIME BRICK PLANT MACHINERY

Mixer, Press Brick Machine, Hopper, two Steel Driers 6' diameter x 64' long; forty Conveyor Cars, 4-wheel, cast iron top; two Turn-Tables, Single Drum Hoist, Electric Grinder, etc.

Will Sacrifice for Quick Sale

THE ACME EQUIPMENT COMPANY, Inc.
310 C. P. A. Building Detroit, Mich.



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A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

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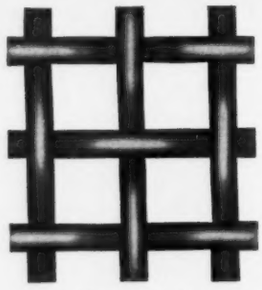
Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

THE CLEVELAND WIRE CLOTH & MFG. COMPANY
3574 E. 78th St. CLEVELAND, OHIO

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AGITATING MACHINERY
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PIPE LINE ACCESSORIES

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701-745 KENTUCKY AVENUE -- -- -- -- INDIANAPOLIS, IND.

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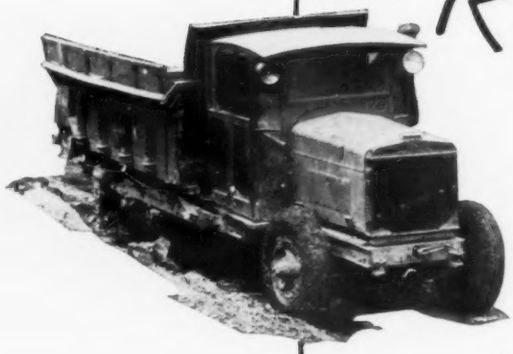

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Heavy hauling calls for engines that operate *at their best* under load . . . engines capable of delivering a steady flow of uniform power for the long, hard pull, without putting a rough or jerky strain on transmission or differential.

Only with an accurately metered fuel-charge can the Diesel engine give you its full, smooth power to lug and pull under heavy loads.

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INDUSTRIAL • AUTOMOTIVE • MARINE

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1933 East Wayne Street **Fort Wayne, Indiana**

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—for profit and satisfaction

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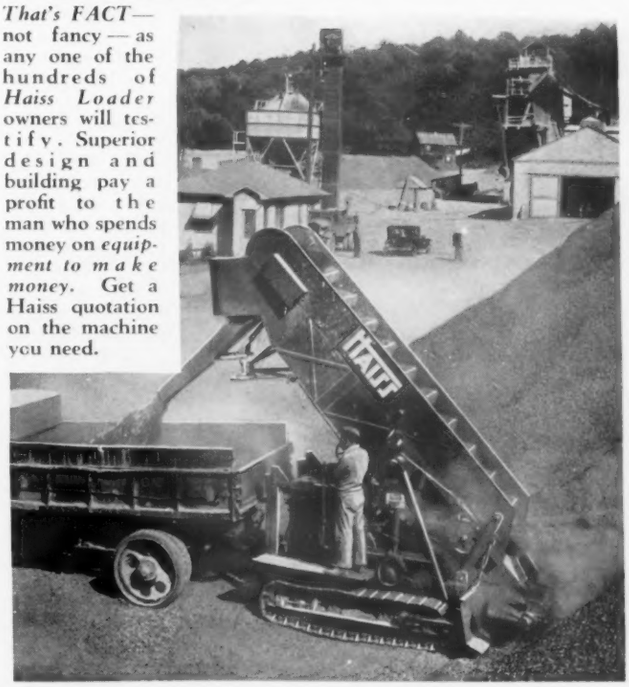

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"The handiest of hand books"

General Manager:—

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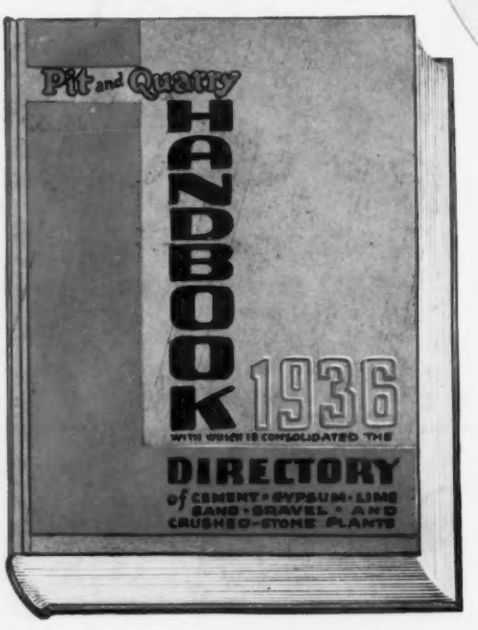
They all get it



For Purchases

For Reference

They all use it

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The Engineer:—

"Good book to have on hand as a reference"

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